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• A

DICTIONARY

OF

PRACTICAL MEDICINE.

VOL. I.

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LONDON
PRINTED BY SPOTTISWOODE AND CO.
NEW-STREET SQUARE

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ESQ

· **WORK**

“Ὁ Βίος βραχύς, ἡ δὲ τέχνη μακρὴ, ὁ δὲ καιρὸς ὀξύς, ἡ δὲ πείρα σφαλὲρῇ, ἡ δὲ κρίσις χαλεπή. Δεῖ δὲ οὐ μόνον ἐαυτὸν παρέχειν τὰ δέοντα ποίοντα, ἀλλὰ καὶ τὸν νοσέοντα καὶ τοὺς παρόντας, καὶ τὰ ὄξωθεν.”

HIPPOCRATES.

“Man is born unto trouble as the sparks fly upwards.”

JOB.

“Honour a physician with the honour due unto him, for the uses which ye may have of him : for the Lord hath created him.

“For of the most High cometh healing, and he shall receive honour of the king.

“The skill of the physician shall lift up his head : and in the sight of great men he shall be in admiration.

“The Lord hath created medicines out of the earth ; and he that is wise will not abhor them.

“Then give place to the physician, for the Lord hath created him : let him not go from thee, for thou hast need of him.

“There is a time when in their hands there is good success.”

ECCLESIASTICUS, chap. xxxviii. v. 1 et seq.

“Quæ regio in terris nostri non plena laboris?”

VIRGIL.

“Multorum disce exemplo, quæ facta sequaris, quæ fugias.”

CATO.

**“——— Mentem sanari, corpus ut ægrum,
Cernimus, et flecti medicina posse videmus.”**

LUCRETIVS.

**“To ignorants obdurde, quhair wilfull errour lyis,
Nor zit to curious folke, quhilke carping dois deject thee,
Nor zit to learned men, quha thinks thame onelie wyis,
But to the docile bairns of knowledge I direct thee.”**

JAMES I. of Scotland.

**“Man is all symmetrie,
Full of proportion, one limbe to another,
And all to all the world besides ;
Each part calls the furthest brother,
For head with foot hath private amitie ;
And both with moons and tides.”**

GEORGE HERBERT.

TO
WILLIAM FOTHERGILL COOKE, ESQ.
OAKLANDS, HANTS

TO
PETER DICKSON, ESQ.
UPPER BROOK STREET

TO
HENRY JOHNSON, ESQ.
CRUTCHED FRIARS

TO
DANIEL LOUTTIT, ESQ.
PULTENEY TOWN, CAITHNESS

TO
PATRICK PANTON, ESQ.
EDENBANK, ROXBURGHSHIRE

AND TO
THOMAS GODFREY SAMBROOKE, ESQ.
EATON PLACE, BELGRAVIA

THE AUTHOR DEDICATES THIS WORK

WITH
AFFECTION AND GRATITUDE
FOR THEIR
LONG AND INTIMATE FRIENDSHIP.

Old Burlington Street.

July 1858.

11799

P R E F A C E.

I. THE Author deeply regrets the long period he has required to complete his undertaking: but circumstances, which he could neither prevent nor control, obliged him to bring out the early Parts of it sooner than he desired, and delayed the subsequent Parts, which he was anxious to execute in a manner commensurate with the character and success of those which were published.

A work requiring for its satisfactory performance an acquaintance with, and a frequent recourse to the best authorities, and a constant regard to the results of the Author's observation and matured experience—to his written notes, as well as to his repeated recollections—could not be completed in a few years. The frequent interruptions arising out of public and private medical practice; the fatigue of body and mind which this practice involved; the calls required from him, the visits made, and the letters written to him, by those in his profession who claimed his attentions; the anxieties resulting from the more intimate relations of life; the disappointments and losses which often fall the most severely where they are most intensely felt—all have combined to delay the completion of an undertaking commenced with enthusiasm, and, notwithstanding numerous discouraging and retarding circumstances, prosecuted with perseverance.

During the many years the Author has devoted to this work, he has employed the time which his more active professional duties during the day allowed him, in making notes, in referring to authorities, and in comparing the descriptions of the individual cases which had come under his care—of their histories, progress, course, complications, and treatment; whilst he has employed some of the hours usually given to repose, in digesting the results of his observations and studies into the following performance. Accustomed from early age to much endurance and application, endowed with a strong and a sound constitution, and enjoying through life uninterruptedly good health, for all which he cannot be sufficiently grateful to an almighty and gracious Providence, he has been enabled to pursue his avocations, notwithstanding the interruptions alluded to, with much less loss of time in the restoration of the powers of nature in sleep than is generally required.

Thus endeavouring to economise and to regulate his time between the active duties of practice, and the not less important duties of teaching, orally and by his writings, the Author believes that he has succeeded in

studying the remoter relations, and the more intimate connections of disease, as well as their differences in seat, character, nature, and form. Also, when enumerating symptoms, references to those which are indicative of danger, or even of a fatal issue, cannot be overlooked, especially as they constitute the division of *General Prognosis*, comprised by the more comprehensive department of Symptomatology; *Special Prognosis* — or the prognosis of individual diseases — being discussed as a part of the pathology of these diseases, and in due connection with them.

A full consideration of the states and manifestations of morbid actions cannot be limited to the discussion of Symptomatology, and the sympathetic relations of disease. These subjects are merely the indications or outlines of general principles, which require to be filled up and illustrated by the more precise descriptions of the forms, courses, and complications of diseases, as they are observed in practice, in different seasons and climates, in different epidemics, and in different races. The diagnosis and the alliance of morbid conditions, although furnishing opposite indications, also require to be duly estimated, in our endeavours to obtain precise and specific information as to the natures and tendencies of diseases. It is not only the features of disease, but also the expressions of these features, which require to be studied in the investigation of the seats and vital relations of morbid action, and of the extent to which the blood and the tissues may have become contaminated and altered: and in our attempts to form a prognosis of disease, not only should these features and their expressions be duly studied, but also the extent to which they are affected, and the character of the change produced, by the means of cure which have been employed. During the course and treatment of disease, the very important diagnosis between the changes which may be imputed to the natural procession of morbid phenomena, and those which result from, and are the actual effects of, the medicinal agents which have been taken, is too frequently either neglected, or altogether unknown; and the ignorance, more than the neglect, of this diagnosis has been the cause of more serious mischief than can well be credited, unless by those whose enlightened experience and habits of close and unbiassed observation enable them to form an opinion.

To the diagnosis of the effects or symptoms produced by the usual causes of diseases, and by the action of medicines when given in excess, may be added the diagnosis of the operation, or, in other words, a due recognition of the modes of action of causes in developing morbid conditions. Thus, owing to numerous causes, more especially to original and acquired diathesis, to habits of life, and to modes of living, to indulgence in animal food beyond the wants of the economy, to the abuse of fermented and distilled fluids, to the many causes of debility and exhaustion, the organic nervous force is lowered, digestion and assimilation are impaired, secretion and excretion are diminished, nitrogenous and other excrementitious matters, the extreme products of animalisation, accumulate in and contaminate the blood, occasion numerous diseases, especially gout, rheumatism, cutaneous eruptions, visceral inflammations, &c., and require for their removal and for their counteraction or prevention, an early recognition and diagnosis of them; and, as shown by the Author in the early Parts of his work (published 1832-7), a recourse to means which may increase the secretions and excretions, may depurate the blood, and

and with which dynamic states are also associated. The specific perversions or infections, for instance, characterising small-pox, scarlet-fever, &c., are associated either with an exalted, or with an impaired state of vital force and of vascular action at different periods of these maladies. These perversions may be manifested by both the organic nervous system and the vascular systems and fluids, in various grades in different cases, and may be so great as to occasion danger or death, even independently of the dynamic states of action. In these cases, it is not only the dynamic, but also the specifically perverted, conditions—the latter more particularly—against which the physician must direct his agents, internal, external, and emotional, appropriately to these conditions, endeavouring, at the same time to counteract, to neutralise, and to remove those more material and manifest alterations which, while they are the results of these perversions, become the most influential agents of their increasing and exterminating effects.

VII. GENERAL THERAPEUTICS may be viewed as the capital of the column which the medical teacher has erected in honour of that science, to the study of which he has devoted his life. It is attempted in this work to point out the several causes which combine to retard, if not to arrest, the progress of therapeutical knowledge. The *Principles of Therapeutics* are next stated, and divided into the Fundamental, into the General, and into the Special; these being severally illustrated and enforced by practical precepts and indications, having due reference to the states of vital force, of the circulating and secreted fluids, and of altered structures. The Author has endeavoured to develope, under this head, the principles and intentions which should guide the student and the practitioner of medicine in the application of the knowledge they have acquired of other departments of science to the grand objects of curing and of alleviating diseases. This most important subject is concluded by a classification of hygeienic and therapeutical agents, according to their modes of action and to their effects—according to their physiological operation and to their curative influences.

VIII. From the commencement of his lecturing on the Principles of Pathology and the Practice of Medicine, the Author adopted a *Classification of diseases* based on the Vital Force, as manifested by the several systems and organs of the body. He viewed disease, especially in its early states and stages, to be the result of causes affecting the conditions of this force in one or other of these systems and organs; these conditions either passing into the healthy state, under the influence of this force, or extending to and deranging other allied systems and organs, thereby perpetuating or complicating disorder, until important changes supervene in the fluids, or in the structures, or in both fluids and structures. Conformably with this doctrine, and after a due consideration, 1st, of the causation of morbid conditions; 2d, of the nature and genesis of these conditions; 3d, of the changes they occasion; and 4th, of their mutations, metamorphoses, and terminations,—subjects fully discussed under the heads, DISEASE, BLOOD, CRISES, EXCRETION, IRRITATION, SYMPATHY, and SYMPATHETIC ASSOCIATIONS OF DISEASE, and forming a system of General Pathology,—the Author entered upon the study of the special forms of disease, commencing

until the secretions, the circulating fluids, the excretions, and the structures become contaminated and organically altered, and capable, as respects certain specific maladies, of communicating the same morbid actions to healthy but predisposed and susceptible persons, exposed to the emanations proceeding from them.

In our examinations of the sources and causes of several of the maladies which are often most prevalent, and which prove most destructive to the human race, their connection with epidemics, or epizooties, in the lower animals has been too generally overlooked. That diseases, originating and becoming prevalent and fatal in the lower animals, often extend to, or infect, the human species, and that they may be recognised in this species by appearances and symptoms as nearly allied as the different circumstances of man and the lower animals are capable of manifesting, have been satisfactorily demonstrated in respect of more than one of the exanthematous diseases. Established facts of this nature suggest further researches into the concurrent causes and the phenomena not only of these, but also of other infectious and contagious diseases, and more especially where such a connection may be presumed to exist; for if disease may thus originate on any occasion, it may on others, and thus the evil may be multiplied, or even perpetuated.

X. *The descriptions* of diseases are based chiefly on the Author's own observation. His experience had demonstrated to him, what others had either overlooked, or not ventured upon, that the very different conditions and manifestations of morbid action, and the diversified characters of local and specific diseases, caused by circumstances not always manifest or even recognisable, but exerting nevertheless a more or less powerful influence on the state, course, and issue of these diseases, required due consideration, in respect both of their pathological relations, and of their treatment; he, therefore, has endeavoured, not only to describe the more usual forms and courses of diseases, but also to notice and to distinguish these modifications and differences, to assign them to their specific or influential causes, and to point out the means of cure most appropriate to each.

The nature of the predisposing and exciting causes; original constitution, temperament, and diathesis; endemic and epidemic influences, climates, and states of season and weather; secret habits and vices; the emotions and passions; the deficiency, superabundance, and the nature of food; overcrowded places of resort; a foul and too frequently respired air; infection and contagion in their various modes of transmission; peculiarity of race and varieties of the species, and the prevailing epidemic constitution, are severally, and in their diversified combinations, considered by the Author, with reference to the forms, states, the course, and issue of diseases. These circumstances, modifying, diversifying, or altogether changing the characters and states of local, or even of specific maladies, he has extended his descriptions so as to comprise the *different forms* thus produced, whether simple or complicated, and he has considered them with reference to their modifying and appropriate causes, as fully as his limits would admit.

Having viewed diseases as they are influenced, modified, or altogether changed by the above causes, or by their various combinations acting on

slight difficulty : and this difficulty is greatly augmented by the desire of conveying accurate views in concise, appropriate, and forcible language, without unnecessary amplification or repetition. Our perceptions of diseased actions may be distinct and accurate, and our conceptions of their causes and tendencies may be lively, or even forcible in our own minds ; but to convey these with equal accuracy and force to the minds of others—to place them before the mental vision of the reader, as we have seen and considered them—and to render them objects of that amount of interest which their importance and tendencies demand, cannot always be accomplished, so as to fully satisfy the mind of the describer, and the wants of those whom he endeavours to instruct. To fail in accomplishing an object of so great difficulty—a difficulty of which an idea can be formed only by making an attempt to overcome it—may not attach to it greater blame than may be imputed to all attempts which, from the nature of the object, preclude perfect success. But, although this has not been reached by the Author, yet he cannot divest himself of the hope that his efforts have not altogether failed, and that close observers and candid judges will allow that he has endeavoured to describe faithfully what he has carefully observed ; and to elucidate, neither irrationally, nor unprofitably to the reader, the sources, the natures, and the issues, of the numerous maladies which his undertaking comprised.

XI. The pathology and treatment of FEVERS and PESTILENCES are fully entertained. The Author has endeavoured to adduce all that has appeared to him deserving of description and elucidation, and to remove much error of long existence as to their nature and treatment. He has fully considered their causes, both those which primarily influence the vital force and its several manifestations, and those which affect the constitution of the circulating fluids. Certain of these causes, especially specific infections, have been supposed to act primarily on the blood ; but the long periods often existing between the impression made by the causes, and the manifestation of their effects, as well as the character, course, and issue of these effects, render it more probable that the morbid impression is directly and primarily made upon the organic nervous system, the vital force of which is changed conformably with the nature of this impression ; the consecutive changes being a series of effects more or less slowly evolved, until, after various periods, these changes break out into more or less acute disorder implicating the whole organisation. If the phenomena of all infectious fevers—the typhoid, the exanthematous, the malignant, and the pestilential—be closely considered, it will be found that the infectious agent may instantly and sensibly impress the body so as to produce a feeling of sinking at the epigastrium, often followed by nausea, vomiting, or retching, by manifest disorder of the organs supplied with the organic or ganglial nervous system, and by changes of the secretions, the excretions, the circulating fluids, especially the blood, and ultimately of the vital cohesion and physical conditions of the several structures. That the morbid impression is primarily made upon that portion of the organisation especially devoted to secretion, assimilation, and the growth, nutrition, and development of the body, is shown by the permanence of certain of its effects,—by the circumstance of the constitution being rendered insusceptible of the impression of the same morbid agent for ever after, and by the

should be attached to an idiopathic or primary malady. But it is not easy, or even possible, to determine, in every case, the primary or the consecutive nature of a complaint; and when the former cannot be ascertained at once, means should be used to mitigate the symptomatic disorder, which, by its severity, may mask the original lesion. Disorders also referred to the same seat may be either primary or symptomatic, and hence should be practically viewed and treated as either condition is inferred. Moreover, the complaint, although obviously symptomatic, may attach to itself the importance and the means of cure which a primary disease would suggest. Many also of the disorders usually denominated as symptomatic are, from their severity and pathological relations, complications rather than prominent symptoms; they are, on this account, and owing often to their severity, practically viewed by the Author with all the interest which is attached to idiopathic diseases.

XVIII. At the present day the practice has grown up (and prospered as a trade) of viewing diseases, both those which are chiefly internal, and those more external or local, and of exhibiting them to the public as being better understood from being specially professed. But man, although furnishing the most wise, the most complex, and the most wonderful of all machinery, is not an inanimate machine, but is endowed with vital force distributed to, and actuating numerous systems, organs, and parts, and evincing functions and offices duly connected with and influencing each other, so that the conditions of each are manifested by all, in various modes of action, of existence, and of change. Hence the state of one organ or part cannot be considered in practice, either correctly or safely, disconnectedly from the rest of the economy; and hence an interference with a single organ may, without due reference to the state of the whole body, endanger the life of the individual. Whoever attempts to cure an external sore, an eruption, or even certain internal or local affections, without considering the relations of these affections to visceral disorder, may either, by effecting what he professes, occasion a most severe or fatal malady; or he may fail in his attempts, or even aggravate the disease by an incompetence to estimate correctly the sympathetic and the symptomatic relations of the affected organ, and of the disease of which it is the seat. All parts of the frame are bound together by the vitality which endows them; and the meddling or ignorant interference with one part, without duly considering the existing conditions and relations of the others, and the contingencies which may arise from such interference, is more likely to extend or to perpetuate, than permanently to remove disease.

The medical or the surgical specialist may err, not only by suppressing a discharge, or by healing an eruption or a sore, which have become safety-valves to a morbid constitution, or have warded off a disease to which an internal organ is predisposed; but he may err still further by his ignorance of the operation of medicines which, when given in excessive doses or too long continued, may produce effects much more serious or even dangerous than the affection for which his vaunted treatment was employed; and, moreover, he may be, as he often is, most comfortably unconscious of the evil he has occasioned, by his being completely ignorant of the symptoms by which these bad effects are indicated, and of his

—is to be assigned to more than one cause: but there is no cause half so influential in occasioning this calamity, as that secret vice, which has been denounced in several parts of this work, from a knowledge of its great prevalence among young persons of both sexes, and of its most injurious influence on the healthy conditions of both mind and body. The infirmity of mind and the extreme credulity which it induces, before it completely prostrates the faculties, render those addicted to self-pollution, those of the male sex more especially, the weak and drivelling victims of a class of unqualified, unfeeling, and imposing pretenders, from whose misrepresentations the laws furnish no protection, and upon whom no restrictions are imposed. The great importance of guarding against this most vile and degrading vice has not been sufficiently recognised by medical writers, especially systematic writers; but, as it can be shown that a large proportion, if not the majority of cases, of chronic diseases and of the infirmities of mind and body in both sexes, arises from this vice, practised at a period when the structures of the body are advancing to or are assuming their full development, a due regard should be directed to means of preventing it, inasmuch as it has become a most prevailing, a most debasing, and a most destructive physical and moral evil.

XX. Poisons have been ably investigated by modern medico-legal writers, chiefly, however, as regards the lesions they produce and the methods of detecting them in the digestive canal and structures of the body. The chemical and the medico-legal investigations of poisoning are not entertained, because they do not come within the scope of this work. But poisons are individually considered as respects their acute, and their chronic or slow operations and effects, each poison producing, according to its nature, specific effects, and therefore requiring an appropriate treatment. The chapters on the nature, operation, and treatment of individual poisons are prefaced by an account of the modes in which poisons are used and the varied circumstances in which they are had recourse to. Without this information, the accidental or the felonious use of them may be mistaken for the course and issue of natural diseases or even of puerperal maladies. The exhibition of poisons also during disease, either singly or added to the medicines which the patient has been taking, has often not been sufficiently recognised or even suspected by the medical adviser; and hence there is reason to believe that many persons have been destroyed without the cause having been recognised, and the effects of acute as well as of chronic or slow poisoning have been mistaken for the course and issue of natural disease. In order that this view of poisoning should not be overlooked, that the symptoms may be more clearly determined, and that the treatment should be both suitable and successful, the Author has fully considered the *modus operandi* or the physiological action of individual poisons, and has arranged them according to the more prominent characters by which their operation is manifested. The treatment advised for each poison has been as fully described as the limits of this undertaking could admit, both as respects the employment of antidotes, and as regards the selection of means for the removal of the injurious effects they may have produced.

The serious effects, as well those of acute as of chronic poisoning, and their diagnosis from natural maladies, have been fully described, and the

have increased. Besides, the single observer should not suppose that the whole sphere of correct medical information can be embraced by himself, or that his own extent of acquirement should constitute a sufficient amount of knowledge.

It is unnecessary to allude further to particular departments of this work, or to subjects which have received especial attention and development. It is desired, and, indeed, most ardently desired, that every part of this difficult undertaking should be closely, but candidly, scrutinised; for, although the Author has been a student during his life, he is not too old to learn and to derive advantage from judicious criticism.

XXIV. The Author may be permitted to state the incentives to his undertaking, and the sources of the hopes he has entertained of being enabled to accomplish it. When he entered upon the study of these departments of science, which are the bases of practical medicine, he felt the want of a work which would supply students and practitioners of medicine with that amount of knowledge which the due and conscientious discharge of their duties required. He had had the advantages, at that time too seldom enjoyed by medical students, of having pursued, during four years at the University of Edinburgh, those studies which form the best introduction to the attainment of medical knowledge, and not only of having assiduously attended the lectures, but also of having possessed the acquaintance, and he may say, the friendship of men whose names will long live in the annals of literature, science, and philosophy, — of DUNBAR, RITCHIE, LESLIE, PLAYFAIR, STEWART, JAMIESON, HOPE, NIELL, and FLEMING, — names he now recalls with all the happiness connected with the best of his early reminiscences. After having devoted eight years to preliminary and professional education, he closely observed, during two years, the diseases which prevailed in France and Germany soon after the peace of 1815. He subsequently extended his field of observation and experience to the most unhealthy intertropical countries; and on his return to England, he was required, from the commencement of his practice, to exert his powers of observation and discrimination in the treatment of diseases of difficulty and danger, and in examining critically the merits of those medical writings which were produced in this country and on the continent of Europe.

Having been engaged in writing on scientific and medical subjects from 1819 until the present day, and in lecturing on Pathology and Practical Medicine from 1824 until 1842; having from the earliest of these dates enjoyed as extensive opportunities in public and private practice, as he could use with advantage to his patients and to the advancement of his own knowledge; and being fully impressed by the truths which extensive fields of observation and mature experience had disclosed, he has ventured to state his opinions with the confidence inspired by a firm belief of their accuracy. To hesitate in conveying instruction, and in employing remedial means, betrays insufficient knowledge, and has never been rewarded by more than accidental success; but a firm conviction and expression of the truth of what is stated or advised, will generally produce belief in the mind of the reader or hearer. Hesitation rejects, where it fails in suggesting, further investigation: confidence commands belief, even when further research is required, and obtains success as its reward.

cumstances and contingencies which few could have endured. He has received no assistance in furtherance of his undertaking, nor with his knowledge of human nature would he have accepted any. Some inaccuracies are inevitable in a work so extensive and laborious as this is; but the Author believes that they are not many or important, inasmuch as every line of it was written by his own hand, and all the proofs were carefully read and corrected by himself.

Of the manner in which he has conveyed his ideas, his doctrines, his descriptions, and his instructions, it does not become the Author to venture a confident opinion. He has endeavoured only to be clear, forcible, and condensed. He has avoided a parade of scientific and technical terms and of foreign words and phrases, and has preferred English expressions wherever they were admissible, and the instances were rare in which they were not only appropriate, but even preferable.

Thirty years of his life have been devoted to this work by its Author. He has laboured on it alone and unassisted. He has, however, been encouraged to persevere to its completion by the friends to whom in gratitude he has dedicated it, and by the indulgence and liberality of his Publishers. He feels with becoming thankfulness the kindness of many in the profession throughout the three kingdoms, who have confided in his medical knowledge and have thereby enabled him to provide for the day which was passing over him, and for those dear and nearly related to him, whom misfortune and death have left to his care. And he expresses his heartfelt thanks, not only to those friends, but also to others, who, quite unknown to him as the authors, have been favourable, kind, and considerate reviewers of the parts of the work as they successively, although tardily, appeared. Entertaining no mean opinion of the legitimate exercise of the healing art*, viewing his profession in the light in which it was held in ancient, and even in more modern times, and estimating his work according to the experience and the research, to the time he has devoted to it, and to the amount of labour and the sacrifices it has cost him, he feels assured that he has not laboured in vain; and he cannot doubt that it will be of essential service to many, — that suffering humanity will be benefited, and rational, learned, and scientific medical practice advanced by it. “For his name and memory, he leaves them to men’s charitable speeches and to foreign nations, and to the next age.”

* BACON vindicated the dignity of the healing art by appealing to the example of Christ, and reminded men that the Great Physician of the soul did not disdain to be also the physician of the body.

“Nusquam enim legimus miraculum aliquod ab eo patratum circa honores, aut pecunias, sed tantum circa corpus humanum, aut conservandum, aut sustentandum, aut persanandum.”
De Augmentis, &c., Lib. IV. ch. 2.

CLASSIFIED CONTENTS.

Preliminary Remarks.—An Arranged Contents of his work is attempted by the Author with the object of enabling the student of medicine, and the medical practitioner, to peruse what he has advanced as the results of his observation—of his practical experience—and of his reading, with the most advantage, and in the most suggestive manner. Information is useful not only as respects its amount, but also as regards what it may suggest to the mind of the reader calculated to lead to further investigation and illustration, than the limits allotted by the Author to the many subjects and topics which have come under his consideration could allow. He has endeavoured to arrange these subjects, both pathological and practical, in such an order as may enable the information first afforded, or successively obtained, to contribute to the elucidation, and to the more complete comprehension, it is hoped, of what is subsequently discussed.

It may be necessary to premise that the Classification of diseases here attempted is, as far as the Author is concerned, altogether original, although it was first published in the "*London Medical Repository*," in 1822. Notwithstanding that this attempt was made at so early a period of his practice, he had then enjoyed extensive opportunities of observation in this country, on the continent of Europe, and within the tropics. This classification and the pathological principles here stated are the same as were then published. Comprehensive and close observations, the sources of true experience, which he believes himself to have possessed, as well as to have exerted, have confirmed him in the belief, that his arrangement is the most useful, practically or therapeutically, inasmuch as it is founded upon, and has constant reference to, the conditions of vital force—to that power which actuates the whole human organisation, and to which a continued regard must necessarily be had, and a constant reliance placed, in our efforts to alleviate or to remove disease. During the many years, in which the Author was engaged in lecturing on the Principles of Pathology and on Practical Medicine, he adopted this classification, and he believes that it was then conducive to the acquisition of practical knowledge by his pupils.

This arrangement being thus based upon the states of vital force and upon the unquestionable facts, that disease, especially in its slightest and earliest deviations from health, is a deranged manifestation of life in some tissue, organ, or system; that this deviation is followed by a succession of changes, until alterations of the fluids, secretions, and structures supervene; that the existing change has been induced by that which preceded it, often aided by the persistence of the exciting cause or causes and by the concurrence of additional influences; and that it will itself occasion still further changes, if not arrested by science or art, or by the efforts of nature, or, in other words, by the resistance which the vital force or power may be enabled to oppose to successive or unfavourable changes,—it follows that a due recognition of the simplest and earliest manifestations of disorder, a correct estimate of existing changes, and an accurate view of future contingent alterations and results, are of the utmost importance, not merely as respects the places assigned to them in the classification, but still more as regards the adoption of indications of alleviation or of cure, and the selection of means by which these indications may be fulfilled. Of the essence of life itself we know nothing further, than that it is associated with, and manifested by structure, the simplest and lowest structures displaying its simplest, but yet its most generally diffused functions or properties, the more complex organisations, its higher manifestations, the highest and most perfect of created beings alone possessing its highest faculties.

The lowest formations which evince vitality possess organic nervous corpuscles and digestive and circulating systems; and as we ascend the scale of animal creation, the organic nervous system rises, from rudimental, through more perfect developments, to the most complex and complete, as displayed in the highest order of animals. Over the two latter systems—the assimilating and the circulating—the *organically sensitive* presides; each of these reciprocally aiding and contributing its functions to the *others, and thereby supporting and increasing the vital force, whilst this force itself preserves the*

organic elements in which it is associated, and develops them into specific forms, more particularly when subjected to the influences which excite it into activity. Thus it will be seen that these three prime factors of life, viz., the organic nervous globules and their conformation into ganglia and ganglial nerves, the circulating systems, and the digestive apparatus, which is more especially subsidiary to the others, have certain organs—respiratory, assimilating, secreting, excreting, &c.—which are subservient to the life of the individual—to the maintenance of vital force or power; other organs, as those of voluntary motion, of sense, and of the intellectual and moral powers, for holding communication with the rest of the species and of creation; and superadded organs, intended to perpetuate the species.

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difference in its size. Thus, it is somewhat changed in severe diseases of the respiratory passages, when the entrance of air into the lungs is obstructed; the epigastrium and hypochondria being then pressed inwards and upwards: whilst in some morbid states of the liver and gall-bladder, of the spleen, and of the ovaria, an unusual prominence in their respective regions is frequently observed. But the most remarkable changes in the form of the abdomen is met with when the size of the cavity is also altered. It is scarcely necessary to allude to examples; but, in all those diseases attended with enlargement or diminution of the bulk of this important part of the body, either in one of its regions, in several of them, or in all, inspection should always be performed: it gives greater precision to manual examination; enables us to compare the bulk of a region with the corresponding region on the other side, and with others in its vicinity; and impresses upon the memory the changes which the part may experience during the progress of disease. It should, therefore, never be neglected in all the forms of abdominal dropsy; in peritonitis, chronic or acute; in inflammation of the stomach, liver, spleen, and bowels; in the different kinds of colic, in fevers, in uterine and ovarian diseases; in affections of the kidneys and urinary organs; in all disorders accompanied with obstruction to the excretions; and, in short, in all chronic maladies. It ought never to be overlooked in the diseases of infancy and childhood, of whatever nature they may be.

7. Besides, however, attending in those diseases to the form and size of the abdomen merely, the *motions* which it presents ought not to be neglected. When rightly interpreted, they often furnish important diagnostic and therapeutic hints. But they require to be viewed in connection with the motions of the thorax, and state of the heart's action. In diaphragmitis, peritonitis, gastritis, enteritis, and certain states of hepatitis, the motions of the abdomen are slight or obscure, whilst the actions of the thorax are increased. On the other hand, in several severe diseases of the respiratory organs, particularly in croup, laryngitis, bronchitis, several varieties of asthma, pleuritis, pneumonia, &c., the parietes of the chest are nearly motionless; whilst the movements of the abdomen, especially at the epigastrium, in croup and asthma, are remarkably increased, or laborious. The motions of the abdomen, also, are often not limited to those caused by respiration; but in some cases, particularly in organic changes of the heart, pericardium, aorta, &c., and even in certain nervous disorders implicating these organs, comprise those occasioned by the action of the heart, increased by the state of the large abdominal vessels, and by the emaciation or other morbid conditions of the patient.

8. II. MANUAL EXAMINATION of the abdomen is one of the most important means of diagnosis we possess: but it furnishes information in proportion to the perfection of manner in which it is made. In this very requisite mode of investigation, the temperature of the hand of the practitioner at the time of making it should be attended to, in the great majority of diseases; both as a moderate warmth of the hand is necessary to the greatest delicacy and accuracy of touch, and as its application to the surface of the abdomen will not in that state occasion any disturbance or con-

traction of the muscular parietes. In entering upon the examination, care should be taken not to excite the alarm of the patient. The hand ought to be applied at first in the gentlest manner possible. By observing this, three very important objects will be best obtained; namely, a knowledge of the form, of the temperature, and of the sensibility of the surface of the abdomen.

9. As much more information than this is required from manual examination, the patient should be directed to place himself in a favourable position for a more general and complete investigation. He should be placed on his back, with the head and shoulders slightly and comfortably elevated, and the thighs drawn nearly to a right angle with the trunk. If the bladder be full, it should be emptied. When proceeding to examine, the patient should be told to relax all the muscles, particularly the abdominal muscles. Commencing, therefore, with the utmost gentleness, and passing the hand slightly over the abdomen, we should slowly increase the pressure, with the view of ascertaining the following conditions:—1st, Its temperature; 2d, Its form and size; 3d, Its sensibility; 4th, Its degree of tension and firmness; 5th, The existence of enlargements, tumours, &c.; 6th, The presence of effused fluids; 7th, The probable existence of accumulated secretions and fecal matters; 8th, Hernial protrusions and displacements. On each of these I proceed to offer a few remarks.

10. 1st, The *temperature* of the abdomen furnishes most important indications as to the nature of disease. It is generally always higher than natural in diseases of increased action; and is also often higher when the patient is actually complaining of cold, particularly at the commencement of fevers. In many fevers and inflammations of the abdominal viscera, particularly those of a dangerous or malignant character, the increased temperature is accompanied with a peculiar acrid pungency to the sensation of the examiner; a phenomenon which indicates the utmost risk of rapidly supervening disorganisation. *Diminished temperature* of the abdomen is met with in the period of depression, or cold stage at the commencement of fevers, but very seldom at their termination, even in death, unless in the most malignant or liquefcent forms. It is also met with after injuries of the abdomen, particularly blows on the epigastrium, in anæmia, chlorosis, and other disorders of debility.

11. 2d, The *form and size* of the abdomen are frequently altered, as already noticed (§ 6, 7.); but, in order to ascertain the nature of the alteration, various means of investigation are generally required, particularly those which remain to be considered. When proceeding with the manual examination of the abdomen, it is necessary very gently to increase the pressure, and, when acute pain is not complained of, to make it in various directions,—laterally, downwards, upwards, and backwards to the spine,—so that if altered sensibility of any of the contained viscera exist, it may not escape detection, but be accurately ascertained and estimated; and the examination should always be made with a careful observation of its effects upon the expression of the countenance of the patient. It will also often be requisite to perform the manual examination, now with the points of several fingers, now with the whole of one, or

even of both hands; and occasionally, at the same time that a full inspiration is being made. But it should always be performed with attention to the sensations of the patient, particularly as expressed by the countenance, and to the feelings and ideas it may excite in our own minds. Even the state of action in which the abdominal muscles are often thrown by the examination; the degree of pressure occasioning such action; and the circumstance of tension of those muscles preceding the examination, or being excited by it; as well as the continuance of their contractions, and the periods and occasions of their relaxation, are all important matters in our estimate of the state of the viscera underneath, — more particularly in the various states of inflammation seated in the peritoneum, in the alimentary canal, &c.

12. 3d, The *sensibility* of the parietes of the abdomen is most intimately associated with that of the contained organs, both in health and disease. The sensibility of the epigastric region varies most widely in different persons. It is frequently, even in tolerable health, very great in delicate and thin females. It is always so in inflammation of the viscera, more particularly when the serous membranes are affected; and the more superficial the inflammation, the more tender is the surface. In order to obtain an accurate idea of the state of the sensibility of the abdomen, pressure should be commenced in the gentlest manner, and with the fingers and palm of the open hand. When the patient cannot endure the slightest touch, the disease is then commonly in the parietes, or in the serous membrane reflected over them. When the cause exists more deeply, the tenderness is less acute, and the muscles are almost instinctively brought into action, even before pressure is made, in order to protect the diseased viscera from it.

13. When superficial tenderness is absent, the examination may be made with increased pressure, in order to ascertain the presence of tenderness, pain, or soreness, in any degree or at any part. But caution in thus increasing the pressure is always necessary when the parenchyma of an organ, particularly of the liver or spleen, is enlarged or otherwise affected; for many such affections may be very serious, and yet the sensibility of the diseased part not much increased. I have known rupture of an enlarged and softened spleen occasioned by the rudeness of the examination; and writers have mentioned similar accidents to have occurred to the liver.

14. 4th, The *tension and firmness* of the abdomen require attention, and due estimation of their actual amount; and in connection with the other diagnostic indications furnished by the examination. Thus, when the tension is associated with increased temperature and sensibility, inflammation of one or more organs underneath, particularly of the peritoneum, may be predicated. The tumefaction, degree of sensibility, position of the patient, &c. will further prove the accuracy of the diagnosis. Tension and firmness are always present in the different forms of peritonitis and inflammations of the subjacent viscera, but not uniformly throughout all their stages. Even in the worst or most malignant forms of peritonitis, as those met with in puerperal females, these symptoms are often either almost altogether wanting, or they exist for a short time only. When

effusion of a serous or sero-purulent matter occurs in peritonitis, or when suppuration has followed inflammation of the enveloped viscera, tension as well as firmness disappear. They are generally, however, both present, even when the sensibility of the parietes is not much greater than natural, in chronic peritonitis with the formation of false membranes, or the agglutination of the opposing surfaces of the viscera.

15. 5th, The *presence of tumours* or other morbid growths, or the fact of their absence, has also to be ascertained by a manual examination. This information can be obtained only by this mode of investigation, carefully conducted. If we detect any degree of unusual tumefaction or hardness, we should endeavour to ascertain its exact site; its form, size, connections; its consistence, degree of sensibility; and whether it is fixed or moveable, soft and yielding, or hard; pulsatile or not. The situation of the tumour; its size, form, and degree of fixedness, will enable us to form an idea of the part affected: whilst the absence or presence of morbid sensibility in it, of fluctuation and pulsation, and the manner in which the nearest parts of the abdominal parietes are affected by it, will furnish important indications of its nature. When tumours or unusual circumscribed indurations are detected in any part of the abdomen, we should bear in mind that their sources and kinds are numerous: that they may be formed in the liver, pancreas, spleen, stomach, pylorus, mesentery, omentum, cæcum, kidneys, uterine organs, &c.; that their nature may be extremely various; and that they may consist either of accumulations of some fluid contained in a cyst, or infiltrated in the substance of an organ, or enclosed in its natural cavity, the outlet of which has been obstructed; or of a deposition of some morbid structure, the nature of which can only be known by a comparison of numerous symptoms, and the history of the disease. Care should be also taken that the accumulations of fecal matters occasionally formed in the cæcum, and in various parts of the colon, or that an unusual anterior protuberance or curvature of the inferior dorsal or lumbar vertebrae, be not mistaken, as have sometimes happened, for morbid growths; and that unusually large collections of the natural secretions in their cysts, as of the bile and urine, owing to temporary obstruction to their discharge, be not treated as morbid formations of a very different kind. I have known cases in which distension of the gall-bladder, from great accumulation of the cystic bile, was mistaken for abscess of the liver; and an enormously distended urinary bladder was viewed as dropsy.

16. 6th, The *presence of fluids effused into the peritoneal sac* is best ascertained by placing the patient in the erect posture. If this cannot be done, and if he cannot even sit up, the shoulders and limbs should be placed low; and, whether in the erect or recumbent posture, the palm of one hand laid with a gentle pressure upon one side of the abdomen, whilst we tap, somewhat smartly, with the other hand, on the opposite side. The impulse occasioned by the stroke will occasion, if fluid be effused, a vibratory undulation or shock which will be felt by the other hand, and which constitutes the diagnostic symptom in diseases of the abdomen attended with effusion.

(DUGES.) Or they may be divided into the predisposing, exciting, and efficient causes. It will be necessary to consider the causes with some relation to these distinctions.

4. i. *Predisposing causes.*—The disposition to abortion is, in some females, so strong that the slightest exciting cause will produce it; in other females the most serious injuries, and the most violent mental and moral impressions, are insufficient to occasion it. Some of the predisposing causes are referable to the mother, others to the foetus and its appendages.

5. A. The predisposing causes referable to the mother are numerous, and consist of certain states of the uterus, and particular conditions of the habit and constitution, influencing either the uterus or the embryo itself.

6. The conditions of the uterus favouring abortion are great rigidity of its fibres, and an unyielding state of its parietes, opposing too great a resistance to the dilatation which the organ must necessarily experience; too great sensibility and contractility of the uterus, in the former of which states the other organs of generation often also participate; too great a flow of blood to the uterus and ovaria, either proceeding constitutionally, or from causes which excite the nerves of these organs or parts adjoining; feebleness and relaxation of the neck of the uterus—a condition of the parts which M. DESORMEAUX states he has frequently ascertained to exist in females subject to abortion; and atony of the uterus itself, either from original constitution or long-continued leucorrhœa, or from a severe or protracted labour, a cause which may be conjoined with the one preceding it. The foregoing causes are chiefly productive of those abortions which occur at the same period of pregnancy, and which have been called periodic by some authors.

7. To the above may be added, as strictly referable, a condition of the organ called by PEU immoderate heat of the uterus, which is attributable to an excited condition of the nerves of the organ, and a chronic inflammatory or irritative state of its vessels; also scirrhus, fibrous, fleshy, scatomatous tumours of the uterus; polypus, dropsy, the presence of several children, and the too rapid or too great dilation of the organ thereby occasioned; tumours of, and fluid effusions into, the substance of the ovaria; and inflammation of the ovaria and parts adjoining.

8. The causes chiefly referable to the constitution and habit of the mother are certain states of the atmosphere, to which only can be attributed those frequent abortions sometimes observed, which have even assumed an epidemic form, and of which HIPPOCRATES, FISCHER, TESSIER, DESORMEAUX, and others, have made mention; the sanguine and irritable temperament; plethoric habit; a constitutional disposition to hæmorrhage independently of, or connected with, the foregoing states; habitual menorrhagia; irregular menstruation; great debility of body; excessive sensibility, susceptibility, and mobility of the nervous and muscular systems; hysterical states of the nervous system; the syphilitic and the mercurial poisons; a cachectic condition of the frame; painful and chronic diseases; addiction to masturbation in early life; curvatures of the spine; malformations of the spine and pelvis; hereditary disposition; an acquired disposition arising from

previous abortions caused by accidental circumstances; marriage or impregnation late in life; deficient or improper nourishment; too close cinctures of the body; worms in the intestinal canal; conception at a too early period after delivery, or after a previous abortion; the atonic state of plethora generated by luxurious indulgences, by sleeping in soft and too warm beds, by indolence, a too full diet, &c.; local plethora, or excitement of the uterine organs, occasioned and kept up by sensual gratifications; and the constitutional and local commotion occasioned by infectious, exanthematous, pestilential, and febrile diseases.

10. B. The causes which depend upon the foetus are referable either to the foetus itself or to its appendages. They operate either by favouring the death of the foetus, which acts then as a foreign body in the uterus, exciting the organ to expel it; or by impeding its growth, so that it does not consume, or does not afford a ready circulation to, the blood sent to the uterus; thus occasioning an accumulation of this fluid in the uterine vessels, and consequently congestion, terminating in hæmorrhage and the expulsion of the embryo. Owing to these circumstances, abortion is favoured by debility, or imperfect development of the foetus; by monstrous conformation, and disease affecting it at some period of its early growth; by the imperfect adhesion of the placenta to the surface of the womb, or its implantation over the neck of the organ; by disease of the placenta, as inflammation, apoplectic hæmorrhage into its substance, calcareous deposits, fatty degeneration, scirrhus or cartilaginous induration; the formation of serous cysts, of hydatids, aneurism, or varices of this organ; by atrophy, hypertrophy, or disproportionate size of the placenta; by a too short or a too long umbilical cord; by twisting of the chord around the neck or one of the limbs of the foetus; by diseased structure of the chord itself, as extreme tensity or softness, the formation of tumours or hydatids in it, by knots or adhesions preventing or impeding the circulation through it; great tenderness of the membranes of the ovum; inflammation, thickening, opacity, and irregularity of the membranes; the presence of too much or too little amniotic fluid, and collections of serum, or of a sanguineous fluid, between the chorion and amnion; adhesions formed between the placenta and parts of the surface of the foetus; and, in the more advanced periods of gestation, constitutional diseases, particularly eruptive and infectious diseases, or continued fevers, extending from the mother to the embryo.

10. ii. The occasional exciting causes are extremely numerous. It may be even said that there is scarcely an occurrence in life which may not be occasionally concerned in producing abortion. (DESORMEAUX.) The chief causes of this class are acute diseases; such as fevers, scarlatina, measles, small-pox, and inflammations, particularly of the uterus, ovaria, pelvic peritoneum, colon, &c.; the irritation of adjoining viscera; diarrhœa, dysentery, tenesmus, colic, constipation, hæmorrhoids; hysterical and epileptic convulsions; syphilis; violent pain; disappointment and anxiety of mind; anger, fright, excessive joy; the impression of various odours; threatened asphyxia, particularly from the vapour of carbon; violent exertions and fatigue; dancing; riding on

(DUGES.) Or they may be divided into the predisposing, exciting, and efficient causes. It will be necessary to consider the causes with some relation to these distinctions.

4. i. *Predisposing causes.*—The disposition to abortion is, in some females, so strong that the slightest exciting cause will produce it; in other females the most serious injuries, and the most violent mental and moral impressions, are insufficient to occasion it. Some of the predisposing causes are referable to the mother, others to the foetus and its appendages.

5. A. The predisposing causes referable to the mother are numerous, and consist of certain states of the uterus, and particular conditions of the habit and constitution, influencing either the uterus or the embryo itself.

6. The conditions of the uterus favouring abortion are great rigidity of its fibres, and an unyielding state of its parietes, opposing too great a resistance to the dilatation which the organ must necessarily experience; too great sensibility and contractility of the uterus, in the former of which states the other organs of generation often also participate; too great a flow of blood to the uterus and ovaria, either proceeding constitutionally, or from causes which excite the nerves of these organs or parts adjoining; feebleness and relaxation of the neck of the uterus—a condition of the parts which M. DESORMEAUX states he has frequently ascertained to exist in females subject to abortion; and atony of the uterus itself, either from original constitution or long-continued leucorrhœa, or from a severe or protracted labour, a cause which may be conjoined with the one preceding it. The foregoing causes are chiefly productive of those abortions which occur at the same period of pregnancy, and which have been called periodic by some authors.

7. To the above may be added, as strictly referable, a condition of the organ called by PÉU immoderate heat of the uterus, which is attributable to an excited condition of the nerves of the organ, and a chronic inflammatory or irritative state of its vessels; also scirrhus, fibrous, fleshy, steatomatous tumours of the uterus; polypus, dropsy, the presence of several children, and the too rapid or too great dilation of the organ thereby occasioned; tumours of, and fluid effusions into, the substance of the ovaria; and inflammation of the ovaria and parts adjoining.

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breasts, sometimes with a slight discharge of serum; a flow of a sanious, then of a sanguineous, fluid, and afterwards of blood, either in a fluid or grumous state, from the vulva; diminished motion of the child, soon afterwards followed by perfect cessation of motion; lessened bulk of the abdomen or of the hypogastrium; uterine pains, which become more and more frequent and severe; progressive dilation of the uterine orifice, and prominence of the membranes; and, lastly, expulsion of the amniotic fluid and foetus, followed, at an indefinite time, by the placenta. Most frequently the discharge of blood does not cease until the placenta is expelled. (DESORMEAUX.)

16. Abortion proceeding from the more energetic exciting causes is sometimes preceded by pains, and an unusual sense of weight in the loins and at the lower part of the vagina; by horripilations or rigors, by general uneasiness, and cardialgia or nausea. From the first there is often an appearance of blood, followed by the discharge of a sanguineous serum, which soon passes into serious hæmorrhage. In other cases the action of the cause is instantly followed by a large effusion of blood, which continues until after the expulsion of the foetus and its appendages. Frequent lancinating pains dart through the abdomen, chiefly in the direction of the umbilicus and vulva: the uterus makes efforts at expulsion, and the foetus is expelled. The more advanced the term of pregnancy, the nearer do the symptoms approach to those of delivery at the full time; and the nearer also do its consequences assimilate to those following upon a natural confinement, as the lochial discharge, after pains, milk-fever, &c.

17. It is sometimes observed, even up to the middle period of utero-gestation, that the foetus is expelled enveloped in its membranes. But it sometimes also occurs in the first months, that, after the rupture of the membranes, the foetus and placenta are retained, decomposed, and discharged in the form of a brown foetid sanies. In other cases the placenta is not expelled until several weeks after the foetus, either in the state now described, or in that of a putrid mass. It occasionally is observed that the placenta continues attached to the uterus, and is nourished, increasing in size, and assuming the appearance of a fleshy mass, in which are sometimes found simple cysts, or cysts containing hydatids. This latter occurrence takes place either when the foetus had been expelled, or had died at an early period of its formation; and, whilst it was yet small and nearly gelatinous, being dissolved during the process of decay in the amniotic fluid, or preserved in it.

18. This change in the placenta forms what has been called by DESORMEAUX and others the *mole of generation*; the chief character of which is that it possesses a cavity lined with a smooth membrane, the remains of the amnion. Frequently, at the more advanced periods at which abortion takes place, the foetus is expelled alive; but the duration of its life subsequently depends upon its age, and the circumstances attending its abortion. It sometimes also is dead before it is expelled, occasionally for a considerable time; although it may have reached the age of several months. Its death does not necessarily lead, although it does generally, to its expulsion. In

some cases it is retained even up to the full period of utero-gestation, and is then thrown out in a state of peculiar softening and maceration, but without putrefaction: this only occurs when the membranes have remained entire, and air been excluded from the interior of the uterus. In other instances it is converted into a substance resembling adipocere, or the fatty substance generated during the decomposition of animal matter. In rarer cases the foetus and envelopes become hardened, and even converted into a bony or petrous state, and retained till the natural death of the mother; or, in the course of some months, or even years, occasion inflammation of the uterus, and suppuration. Sometimes, in cases of this latter description, a portion of the uterus forms adhesions to the parts opposite; the abscess which is formed extending in that direction, and opening on the surface of the abdomen, or in the interior of the intestinal canal, or into the vagina, and giving issue to purulent matter, mixed with a foetid sanies, and portions of bones arising from the decomposition of the textures of the embryo. But these latter consequences of abortion are rarely met with unless in cases of rupture of the womb, or extra-uterine impregnation.

19. In some cases of abortion the hæmorrhage from the uterus continues to a serious extent for several days. This may be the case at various epochs of pregnancy; and may result from the detachment, partial or general, of the placenta, and its retention along with the foetus in the uterine cavity, owing to imperfect action of the uterus to eject it. It may also proceed from the expulsion of the foetus, and the retention of the placenta, either altogether or partly separated from the uterus. In some cases the presence of the placenta, or of a portion of the membranes in the womb, or in the os uteri and upper part of the vagina, by the irritation thereby occasioned, may have the effect of keeping up a constant and exhausting hæmorrhage. In a case of abortion to which I was recently called, the practitioner in attendance stated the foetus to have come away two or three days previously. Upon inquiring as to the discharge of the appendages, I was led to recommend an examination *per vaginam*; when they were found lodged partly in the vagina and os uteri. After their removal the patient rapidly recovered.

20. III. DIAGNOSIS.—The diagnosis of abortion should be directed to three objects: 1st, its cause; 2dly, to the possibility of preventing its occurrence; and, 3dly, to ascertaining the stage or development of the process. The causes of abortion are generally readily recognised, and admit of an easy explanation. There are two, however, to which Professor DESORMEAUX has particularly directed attention; namely, rigidity of the fibres of the fundus and body of the uterus, and laxity of its neck. The former of those is generally connected with a similar state of the whole system, and accompanied with scanty or painful menstruation. In the first impregnations abortion takes place at an early period; but in subsequent impregnations the period of gestation approaches more nearly the natural epoch, the female at last bearing children to the full time. When the abortion is referable chiefly to laxity of the neck of the uterus, a result contrary to the foregoing takes place; the period of abortion approaching nearer, in successive conceptions, to

general plethora or excitement, rather cooling than otherwise, and such as may promote, rather than retard, the natural actions of the bowels. Lemonade, imperial, barley-water, toast-water, &c., are amongst the best in this class of cases.

29. Much will depend upon the perseverance with which this plan may be followed, particularly in cases of habitual or precedent abortions; where it ought to be rigorously enforced and continued for months, or, at least, for a long time after the period of gestation at which the former abortion occurred. If the threatened abortion be accompanied with pains, or by any degree of discharge, an opiate should be given at bed-time; and, in every case where we have conceived it requisite to abstract blood, either generally or locally, even as a preventive measure, the operation should be followed by a dose of opium.

30. Attention to the bowels is indispensable; but great discrimination is necessary in the choice of laxatives when the bowels are constipated. These should be of the most cooling and gentle description. The soluble tartar, and cream of tartar in the form of electuary, or with confection of senna, particularly in cases of plethora, are very eligible. Castor oil, with a very few drops of laudanum, which will not retard its operation; or small doses of the bi-sulphate of potash, are also suitable laxatives.

31. When, from our knowledge of the state of the ovum, in previous abortion, we suspect a repetition of it, we may endeavour to prevent it, by using those means which are most successful in imparting energy to the constitution, and, through it, to the generative functions; so that the process of foetation may proceed to a successful issue. This is, perhaps, best accomplished by change of air; the use of the tonic mineral waters, both internally and in the form of baths; by the mineral acids given in the infusions of bitter tonics, or with the solutions of the salts of iron: as the tinctura ferri sesquichloridi; the tinctura ferri æthereæ (see *Appendix*); by the sulphate of zinc, with the compound infusion of roses; by the exhibition of the various balsamic and terebinthinate medicines, combined with the pulvis cinchonæ, or the pulvis rhei, and the carbonates of the alkalies, or magnesia; and by attention to the state of the bowels, to diet, and gentle but regular exercise. The balsams most serviceable in cases of this description, as well as in all those characterised by weak and imperfect uterine function, are the balsams of Peru, of Canada, of Chio, and of copaiba; the terebinthina vulgaris, and T. Veneta. Siebold recommends the balsamum vitæ Hoffmanni (F. 317.), a medicine which enjoys great reputation on the Continent in many diseases of debility. The loins may be rubbed night and morning, for some time, with the linimentum saponis et camphoræ comp. (F. 306.), the linimentum terebinthinæ compositum (F. 311.), or the liniment. anodynum (F. 298.). The application of the emplastrum cumini, the emplastrum picis compositum, or the emplastrum roborans (F. 118.), to the loins will also prove of service.

32. When diarrhœa occurs during the period of utero-gestation, and more especially if it be accompanied with tenesmus, in delicate females, *or in those who have experienced previous abortions, it should be immediately checked or lessened. In these cases disorder is chiefly confined to the*

colon and rectum, which should be soothed by small emollient and anodyne enemata, or by the use of suppositories of lead plaster, and opium. Whilst, however, we thus prevent the irritation from being extended from the large bowels to the uterus, we should take care to prevent the retention of hardened fæces in the cells of the colon, by which irritation will be perpetuated; and to remove them, when we suspect their presence, by the use of gentle laxatives, and emollient and aperient injections, avoiding the use of saline purgatives and cathartics.

33. In cases of threatened abortion in debilitated constitutions, the mineral acids, particularly the sulphuric, either with or without small doses of laudanum, or combined with small doses of colchicum, or of digitalis, are extremely useful. Where the circumstances of the case permit the horizontal posture to be dispensed with, the patient may be allowed very gentle exercise, for short periods, in the open air, avoiding all exertion and local excitement. She should live abstemiously, yet not too low. In many cases of this description a glass or two of light wine may be allowed daily, and in several a still more tonic treatment is required. When this is the case, the infusion of calumba, or of quassia, with the carbonate of soda, and tincture of hyoscyamus, has seemed to me very serviceable; and the patient has been allowed the occasional use of the swing, or a gentle ride in a carriage. The tepid and cold hip-bath, particularly with sea-water, are often of use in cases of this description, as well as the treatment recommended in a preceding paragraph. The necessity of abstaining from sexual intercourse, in all cases of threatened abortion, is most evident.

34. In cases accompanied with incipient discharge, either the cold hip-bath, or sponging the hips, thighs, and lower parts of the trunk with cold water and vinegar; or by squeezing a large sponge filled with cold water, so that its contents may fall in a scattered stream from some height upon the hips and pelvis; will sometimes be serviceable. Injections of cold or iced water, or cold astringent solutions per vaginam, or a lavement of cold water, will sometimes arrest the accession of hæmorrhage.

35. It will occasionally be observed that weak, nervous, and delicate females are often irritable and dispirited from a tedious confinement, during gestation, and even abort owing to this cause; obviously, in many cases, from the effect produced upon the uterus, and upon the nutrition and health of the embryo. This should be anticipated, and prevented by a timely relaxation of the plan, and by allowing the patient as much exercise, amusement, &c., and by adopting as much of the treatment recommended above (§ 33.), as may be consistent with the accomplishment of our end. When, in these cases, the nervous symptoms predominate, the use of antispasmodics, with anodynes, and their combination with vegetable bitters, chalybeates, &c., are often required. The diet should also be nutritious, but easy of digestion, and not too heating and stimulating.

36. The foregoing plan will often succeed in preserving the infant, unless the discharge continues or becomes more copious; the uterine pains, with the other symptoms of commencing abortion, still persist or increase; and the woman

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ABSCESS. SYN. *Abscessus* (from *abscedere*, to depart, to separate), *Apostema*, *Abscessio*, *Vomica*, *Imposthuma*, Auct. Lat. *Ἀποστήμα*, Gr. *Abcès*, Fr. *Die Eiterbeule*, Ger. *Edderbyld*, Dan. *Bulning*, Swed. *Ettergeswel*, Dut. *Ascesso*, Ital. *Abscesso*, Span. *Abscesso*, Port. *Abscess*, *Imposthume*, Eng.

CLASSIF. — See INFLAMMATION.

1. DEFIN. *A collection of purulent matter formed or deposited in the structure of an organ or part.*

2. An abscess is never an original disease, but is constantly the effect or termination of inflammatory action, in some form or grade, or of irritation of the part in which it is seated. This may not seem to be in accordance with certain phenomena connected with the formation of purulent collections, in parts at a distance from those in which inflammatory action originates, and where pus is originally formed: but I shall have occasion to show that it is not opposed to sound views as to this topic, or, at least, that the exceptions to it are few.

3. Without noticing further than to enumerate them, the older distinctions of abscesses into the warm, phlegmonous, or inflammatory, the cold or congestive, and the acute and the chronic, I shall have to show that, instead of proceeding from different sources, they are equally the result of a certain state of inflammatory action, modified into a variety of forms according to the degrees of vital energy and action of the part, and of the system generally, the organisation of the part affected, and the peculiarity of constitution and diathesis. In the present article, a general view will be taken of the pathology and medical treatment of abscess, the consideration of the different kinds of abscess: their various seats, and relations to other diseases, fall under different heads, where they are more advantageously discussed.

4. I. OF THE PATHOLOGICAL CHARACTERS OF ABSCESS. — 1st, *Of abscess proceeding from acute inflammation, with integrity of the constitutional energy.* — When a part becomes inflamed, the vitality of which has not been previously injured, as respects either its individual state, or constitutional relations, its temperature becomes increased, and its vessels are injected with a greater quantity of the circulating fluid than in health, and generally in proportion to the violence of the irritation upon which this afflux of fluid depends. At first the fluid does not extend beyond the vessels in

which it has passed; but, in proportion as it distends them so as to exhaust their tone and power of reaction, and as the vital cohesion of their extremities, and of the tissues which they supply, is weakened, a portion of the more fluid constituents of their contents escapes into the texture of the part affected; infiltrates, and combines with, its constituent elements, and renders it, at first, more compact and dense. But, at the same time that the inflamed part undergoes this change, it loses its vital elasticity, is more friable or lacerable, so as to break down more readily from foreign pressure, or upon the application of a firm ligature.

5. If the inflammatory action stops not here, the tissues affected by it undergo further changes. They pass, more or less rapidly, from a dense but friable state to that of softening; and this quickly but insensibly assumes a pulpy condition, owing to its continued and increasing infiltration with the more fluid parts of the blood, and even with more or less of its colouring particles; the molecules composing the tissues of the part being so combined with, and separated by, the infiltrated fluid, that all distinct traces of proper organisation are lost. From this pulpy state, to which the central portion of the inflamed structure is reduced, the transition to pus proceeds rapidly. But it is not to be understood that the tissues themselves are converted into this fluid. The fluid poured out from the extreme capillaries gradually distends the surrounding parts, and partially dissolves the softened and disorganised tissues in which it is effused. The coagulable lymph, which the tonic or unexhausted vital energy of the adjoining vessels form in the surrounding texture, confines the effused fluid, and prevents it from extending beyond the barrier it opposes; whilst the impaction of the cellular tissue, occasioned by the increasing quantity of purulent effusion, and the pressure it produces in all directions, with the thickening, and the continued deposition of lymph in the parietes of the abscess, tend still further to fulfil this end, and thus to limit the mischief, and to prevent the contamination and disorganisation of the adjoining structures; consequences which not infrequently supervene, when the vital energies of the frame and the state of local action are insufficient to admit of the formation of coagulable lymph, and to throw up this barrier against the extension of disease.

6. The first step of the suppurative process is the dissemination, particularly in the softest, in the first and most intensely inflamed part, of minute collections of a sero-albuminous or sero-sanguineous matter. By degrees, this fluid becomes more abundant. These minute collections enlarge, approach each other, and, at last, the partitions of softened tissue between them are altogether disorganised and disappear; the whole, at last, forming only one cavity of variable extent. As this process advances, the effused fluid changes from a thin albuminous lymph into pus; which becomes more thoroughly elaborated, losing its colouring matter which it had derived from the blood, and dissolving the shreds or *débris* of the disorganised tissues in which it had formed: and when the suppurative process is matured, the pus forms an homogeneous fluid, presenting certain characters distinguishing it from all other animal fluids.

not limited to a particular part, or within distinct bounds; and the fluid which is poured out from the inflamed vessels is not circumscribed, or confined to the centre of the inflamed part. The inflammation which produces this unhealthy and imperfect form of abscess is always characterised by that state of asthenic or ataxic action, local and general, which is incapable of producing coagulable lymph from the blood, that may limit both the morbid action and the effused fluid. (See art. INFLAMMATION.)

14. This kind of abscess not infrequently forms in erysipelas; or after wounds, injuries, and punctures; and from the inoculation of an animal poison. The characters of the succession of morbid actions it presents are want of vital power and resistance, and a speedy solution of the vital cohesion of the affected tissues. It would seem that the influence of the ganglionic nerves supplying the capillaries of the part is rapidly, or almost instantly, destroyed by the cause of the disease; and that the vessels, thus deprived of a great proportion or the whole of their vitality, allow the escape of the more fluid parts of the blood, and the infiltration of the tissues. The vessels pass rapidly, and without the previous grades of healthy inflammation, into that state which admits of the effusion of a watery or puriform sanies. The state of vital energy, and the deficient crisis, or unhealthy condition, of the blood itself, probably contribute to this result; and, with the effect of this effusion on the diseased part, promote the rapid exhaustion of the remaining action of the capillaries.

15. Diffusive abscesses generally commence in, and spread rapidly in the direction of, the cellular tissue. They affect also, in a very marked manner, the other structures placed in their way. They seldom commence in the internal viscera, as the liver, lungs, &c.; but when they do thus originate, as is occasionally observed in the latter stages of malignant or ataxic fevers, in exhausted states of the frame, &c., they nearly approach the characters they assume in the cellular structure. In almost every case of this disease, the constitutional disturbance is very remarkable; and the powers of the nervous system, particularly that presiding over the organic and assimilating functions, are uncommonly depressed. Locally, the effusion of a watery, or sero-albuminous, or a sero-sanguineous fluid, is nearly coeval with the affection of the cellular tissue and congestion of its capillaries. The vital cohesion of the inflamed texture is rapidly dissolved; and the fluid, abundantly poured out in its areolæ or cellules, distends the part, diminishes its vital functions to the lowest grade, and, at points, lacerates its tissue, thereby partially cutting off its connection with the adjoining structures. Thus the fluid is effused from the congested capillaries of the affected part in numerous places: in some, forming considerable collections; in others, mere infiltrations. Parts of the cellular tissue itself, and, in rare instances, as the mischief proceeds, portions of adjoining or intermediate textures, are deprived of all vitality, sphacelate, and mix with the fluid effused.

16. In many cases the integuments participate but imperfectly, and often not at all, in the morbid actions, whilst the process, as now described, is going forward; and the great effusion into, and

partial destruction of, the cellular tissue, have enormously distended the limb or part in a diffused manner, and to a great extent, and given it a boggy or imperfectly fluctuating character. At a later period, parts of the more attenuated or discoloured integuments vesicate, ultimately burst, and give issue at first to a discoloured puriform secretion, which afterwards becomes offensive and otherwise modified. When the skin is affected, it generally presents a dark or livid hue: its temperature is seldom above (excepting, sometimes, at the very commencement of the antecedent inflammation), and frequently sinks below, the natural standard.

17. With respect to the appearance of the secretion in this form of abscess, I may state, that it not only varies remarkably in different cases, but also at different stages of the same case. At first, the fluid effused and infiltrating the cellular structure consists chiefly of a limpid, reddened serum, which readily flows from the divided structures; in a more advanced stage, the effused matter is less fluid, often high-coloured, but without the whiteness and opacity of purulent matter. Afterwards, the cellular membrane is engorged with a white semifluid matter, which separates the particles of fat and cellular tissue at an unusual distance from each other. In subsequent stages it continues opaque; but often becomes reddish, greenish, and more fluid. At a still more advanced period, the infiltrated cellular and adipose tissue are entirely broken down, and the sphacelated portions hanging into, or mixed with, the puriform matter; which sometimes now presents the appearance of a brownish, purulent sanies, sometimes a greenish pus, and at other times a sero-purulent matter of various shades of colour and degrees of consistence. At no period of the disease is the matter contained in any circumscribed cavity, but is gradually and irregularly lost in the surrounding cellular tissue; without any demarcation, or appearance of coagulable lymph about the circumference of the diseased part. In general, the purulent secretion speedily assumes an offensive odour, and its sensible qualities are otherwise altered, and often variously, upon the admission of air to the diseased surface.

18. The muscular structure, and other parts in contact with the puriform matter, and in the way of the spreading disease, is generally much discoloured, softened, easily torn, and sometimes partially destroyed. In some cases the muscles are paler; in others, darker, and more livid, than natural. In rarer instances, the adjoining bones and more resistant structures are also affected. (See INFLAMMATION, *Diffusive*.)

19. 3d, *Abscesses consequent upon inflammation of lower grades of intensity.*—The more slow and obscure the progress of inflammation, the less marked are the signs of irritation preceding and accompanying abscesses. It is not uncommon to observe, in lymphatic and phlegmatic temperaments, fluctuating tumours of various sizes, both superficial and deep-seated; without any considerable pain or increase of animal heat, either antecedent or subsequent to their formation. Purulent collections, of a chronic and indolent character, generally proceed from a low but continued state of irritation, or from reiterated excitation of so low a grade as scarcely to influence the sensibility of the part; and occur in constitutions of weak vital

tomatic of inflammation and ulceration of bones or cartilages is generally greyish, thin, mixed with albuminous flocculi, minute clots of blood, and portions of phosphate of lime. It exhales a nauseous odour: but this characteristic is present only after the opening of the tumour, and when the air has access to the cavity.

26. If we examine the cavities of symptomatic abscesses, and trace them from their origin to their outlet, we shall find, in the former situation, the cartilages and bones profoundly changed: the bones are softened, friable, changed to a greyish black, partially absorbed and carious, and their periosteum destroyed. From this origin of the disease is formed a channel or sinus, traversing the cellular structure frequently in the course of the large vessels or muscles, and terminating with the external outlet of the tumour. The whole of this canal or sinus is usually surrounded by a softened, friable, or lardaceous state of the textures; and lined with a smooth, thick, firm, cellular, or fibro-cellular membrane, which in some cases is of a fibro-cartilaginous structure. At the lower part, the canal generally dilates into a considerable cavity, sometimes irregular or sinuous in its form, and lined with the membrane usually found in the more chronic kinds of abscesses.

27. 5th, *Of consecutive abscesses; or collections of matter found in situations consecutively to its formation in distant parts, between which there exists no communication.*—It has been not infrequently remarked, that inflammation of a part has taken place, and has gone on to suppuration; that the matter thus formed has been absorbed; and that it has subsequently formed in some other viscus, generally in an internal organ. The nature and procession of the morbid phenomena now enounced have led to some inquiry, particularly in recent times. The circumstances in which consecutive abscesses occur in practice are the following:—

Inflammation of the internal surface of the uterus, or of its veins, or of both the substance of the uterus and veins, occasionally takes place after child-birth, and terminates the life of the patient. On dissection, purulent infiltrations or distinct collections of pus are found, in one case, in the lungs; in another, in the liver; in a third, in the substance of the brain; in a fourth, in the capsules of the joints; and, in a fifth, in both the lungs, liver, and perhaps, also, in the joints. A man, from injury of the head, has inflammation of the sinuses of the brain, followed by all the symptoms of a vitiated state of the circulating fluid, terminating in death: after which, abscesses, or purulent infiltrations, are found in the liver or lungs. A similar procession of phenomena occasionally results from phlebitis consequent on blood-letting, or other causes; also during the suppurations following amputations, particularly when the matter is confined on the face of the stump, by the adhesion of the integuments which had been drawn over it. A child is seized with severe or confluent small-pox; and during, or subsequently to, the secondary fever, fluctuating tumours form in the joints from matter accumulated in their capsules. Upon dissection, the cartilages are found eroded; and, in other rare cases of this kind, purulent collections are found in the internal viscera. In other instances, abscess disappears from external parts; the patient

sinks with low fever; and, upon dissection, collections of pus are found in internal organs. In cases of this description, the following require notice:—1st, The state of the vital energies preceding or during the occurrence; 2d, The symptoms characterising the progress of the phenomena; and, 3d, The nature of the results.

28. 1st, The energies and vital resistance of the system are generally greatly impaired, either from pre-existing or concurring causes, in cases where consecutive abscesses form. (See article on *Inflammation of VEINS*.) 2d, The depression of the powers of life increases as the disease advances. The nervous system is seriously affected; the circulating fluid betrays change in its appearances after its emission, or after death; the soft solids lose their vital elasticity and cohesion; the surface of the body and countenance become dusky and livid; and low delirium, rapid and weak circulation, &c. take place. 3d, The purulent matter is generally either infiltrated into the parenchymatous structure of some organ, or collected into one or more distinct abscesses, or it is effused into the cavity of one or more joints. When the matter is infiltrated into the texture of an organ, the infiltrated structure is very frequently also softened. The purulent collections that are found in other cases generally have no distinct cyst, and the surrounding substance of the organ seldom presents any marked redness or injection of its vessels, or indeed any remarkable change, excepting in some instances a slight softening. The matter is usually found in several distinct abscesses or collections, varying from the size of a small seed to that of an egg, or even larger. Sometimes the immediately surrounding structure seems impacted around the abscess, but not otherwise changed. The purulent matter itself varies but little from that which is observed in the abscesses described in the first section. (§ 6, 7, 8.) It is occasionally of a darker or greenish hue, particularly when found in the liver.

29. As to the *Origin* of these purulent collections, some doubts may be entertained. That they are very intimately connected with the primary inflammation and formation of matter in other parts of the system, cannot be doubted, but in what way cannot be so readily stated. It seems to me extremely probable, from the attentive observation of the progress of a number of such cases which have come before me in practice, that, owing to depressed vital energy, and deficient resistance of the frame, purulent matter passes into and vitiates the blood; that the morbid condition of the circulating fluid, thus induced, depresses still lower the already weakened nervous powers; and that the irritating matters carried into the circulating current change the state of the capillaries of parenchymatous and some other organs, so that they secrete purulent matter without any evident sign of previous or accompanying inflammation. Several French pathologists suppose that the purulent matter conveyed into the blood circulates without combining with it, and is merely deposited by the capillaries, or separated by them, from this fluid in parts; the vessels and texture of which are most disposed to permit its elimination, or the best constituted to admit of its deposition. It is difficult to determine in which of those ways the consecutive abscess is formed. Indeed, both may approximate

becomes more elevated, prominent, and softened at the centre of the surface. The redness and tension undergo a similar change. The circumference of the inflamed surface is restored in some degree to the natural state; but the more prominent part acquires a dark red tint, afterwards a bluish hue, and yields more and more to the pressure of the subjacent pus. For some time previous to this stage the tumour evinces a more or less distinct fluctuation when suitably examined, and this sign becomes more manifest as the abscess advances to the surface.

48. When an abscess forms in deep-seated parts or viscera, particularly those protected by solid envelopes, or by thick and unyielding structures, the diagnosis rests entirely upon the nature of the constitutional disturbance, and the disorder in the functions of the affected organ or part, and here the physician should seize and appreciate the slightest difference taking place in the pulse, the animal heat, and the state of all the natural and organic functions. In these cases he requires the most exquisite tact for examination, in order to arrive at an accurate opinion. The symptoms which should guide him in cases of this description will be stated when I treat of the diagnosis of the different kinds of visceral abscess. I may, however, remark at this place, that, even in parts much less deeply seated, when the cyst of an abscess is greatly distended and very tense, fluctuation generally is extremely obscure, or even not to be felt, although its contents may be very fluid. Also, when the purulent matter is contained in no distinct cyst, but is disseminated through the textures, or infiltrated between fasciæ or muscles, or is confined beneath aponeuroses, great incertitude may exist as to its formation. The parts in such cases present more of a diffused œdema than of a fluctuating tumour; and if fluctuation can be at all felt, it is only obscurely.

49. It must be evident that the more feeble and latent the phenomena of the precursory inflammatory irritation, the more difficult is it to determine the period at which the elaboration of pus commences. We frequently observe in practice, particularly after phlebitis, injuries of the head, fractures, and capital surgical operations, abscesses form in the liver, mediastinum, lungs, kidneys, or ovaries, preceded merely by obscure and occasional pain, and furnishing no certain symptoms of a local kind, by which we can decide as to their formation, until the time that they appear externally, or are detected upon *post mortem* examination. In cases of this description, the constitutional symptoms are our chief guides; but even these are often so uncertain and so imperfectly developed as to leave us in doubt. The accession in this obscure manner of internal abscess is particularly remarkable as respects those which supervene to inflammatory disease existing in other parts, particularly to phlebitis, and which I have denominated *consecutive abscesses*. (See *VEINS — inflammation of*.)

50. Symptomatic abscesses generally escape detection until they advance externally. Previous to this, pain, uneasiness, tumefaction, &c., are only felt chiefly in the part originally affected. But the symptoms already noticed (§ 46—48.), especially the unhealthy aspect of the surface, the state of the febrile action and of the pulse, the

night perspirations, the disorder of the respiratory and alvine functions, will generally serve, in conjunction with the changes in the part to which symptomatic abscesses extend, to indicate the nature of the mischief.

51. It is important, as M. DUPUYTREN has very justly remarked, to take into account, when determining the existence of abscess, the greater disposition inherent in some constitutions to form purulent matter. In some persons, the least irritation is followed by the suppurative process. This is particularly the case in persons of a pale visage, of a soft flaccid state of the different structures, and of the lymphatic temperament. It is also remarkable in those whose vital energies have been lowered by previous disease; by chronic affections of the digestive mucous surfaces; and by those diseases which require the performance of amputation, or other important surgical operations. When the suppurative process has continued for some time, and has afterwards been suddenly stopped by an operation, or any other active treatment, the disposition to form abscesses is generally remarkable. A similar remark may be extended to the sudden suppression of any accustomed secretion or discharge. The most familiar instance of this kind is noticed in the breasts of nurses, which are extremely liable to suppuration upon interruption to the secretion of milk. These considerations should have their due weight with us when estimating the signs of the existence of internal abscess. Those symptoms which are peculiar to collections of matter formed in each of the internal viscera are pointed out in their respective articles.

52. IV. OF THE PROGNOSIS OF ABSCESS. The danger from abscess is in proportion, 1st, to the extent of their internal surface; 2d, to the depth at which they are seated; 3d, to the indolence of their action, or the deficiency of vital action accompanying them; 4th, to the severity and danger of the disease by which they have been occasioned; 5th, to the sinking or deficiency of the constitutional powers under them; and, 6th, to the severity of the symptoms accompanying them, or produced by them. These positions are so obvious, that no remarks need be offered in support of them. I may, however, observe, that abscesses seated in internal viscera are always attended with danger; but the degree of danger will depend upon numerous circumstances connected with their seat, the direction which they take, the state of the vital energies of the frame during their progress, the chances of their evacuation, and the means of reparation and renovation the constitution may still possess.

53. The prognosis of chronic, symptomatic, and consecutive abscesses depends as much upon the nature of the preceding disease, as upon the state of the abscess itself. In chronic abscess, the danger is in proportion to the extent of the surface of its parietes, and to the grade of constitutional vice. In symptomatic abscess, the danger depends almost wholly upon the nature and extent of the original disease, of which it is the consequence, and upon the largeness of surface extending thence to the ultimate limits of suppuration. In consecutive abscess, the danger is extreme; owing, in many cases, to the nature of the primary disease, the depressed state of the constitutional powers, and to the vitiation of the circulating

Emollient and astringent applications should also be constantly employed. These will generally reduce the inflammation of the surrounding tissue, favour the resolution of the parts not yet supplicated, limit the quantity of the morbid secretion, and favour the maturation of the abscess, so that it may be opened with the best hopes of success. In some cases, the use of these antiphlogistic measures will give rise to the absorption of the purulent matter, even after this had been attempted to no purpose by means of revulsants.

60. It should be recollected that the surfaces of abscesses are the constant seat of two kinds of action; one of exhalation or secretion, the other of absorption; and that whatever excites or irritates them increases the former, and whatever soothes or diminishes this irritation lessens it, and favours the latter action. This consideration should lead us strenuously to adopt a continued antiphlogistic and soothing treatment of the affected part, until the thinning of the skin at the most prominent part of the tumour indicates the necessity of opening it.

61. In symptomatic abscesses, the treatment should chiefly be directed to the primary seat of disease; for as long as the mischief continues or advances there, the purulent collection increases, and diminishes as it subsides. Thus, the abscesses that point near the anus or crural arch, in consequence of disease of the vertebræ, will sometimes disappear after the use of active means directed to the original malady, and judiciously adapted to the state of the patient.

62. Consecutive and spreading abscesses require a very different management from that now pointed out. These generally occur in persons of an unhealthy habit of body, or who have been weakened by acute disease; or they are the result of an adynamic or ataxic and spreading inflammation occasioned by a specific or poisonous agent; and they are not infrequently the consequence of the inflammation of veins, or of the presence of morbid secretions or purulent matter absorbed into the circulation (§§ 25—28.), or of the transfer of irritation from a distant part. But from whatever cause they may proceed,—and they may, and occasionally do, proceed from either of those sources,—deficient constitutional energy, and vital resistance to the influence of the exciting cause, with a marked disposition of the structures to be invaded by it, and to participate in the morbid action it excites, are their constant concomitants; requiring the energetic use of those means which are the best calculated to rouse the powers of the frame, to restore the deficient tone of the capillary vessels, and to thus enable them to form coagulable lymph, by which the spread of the local mischief may be limited. Instead, therefore, of having recourse to antiphlogistic remedies, the state of local action, and of constitutional power, requires a tonic, stimulating, and restorative treatment; conjoined with the means best calculated to promote the functions of all the abdominal viscera, so that morbid matters may be eliminated from the circulating current, and healthy nutritious elements conveyed into it; and with a pure air to perfect the changes which it undergoes during respiration, and which are requisite to the continuance of the functions of life. The treatment necessary in such cases is fully detailed in the articles on INFLAMMATION OF

VEINS, ON SPREADING INFLAMMATION OF THE CELLULAR TISSUE, and on the treatment of ANIMAL POISONS.

63. 2d, *Of opening abscesses.*—When we fail in procuring the absorption of the puriform matter, its artificial discharge will, sooner or later, be required, when this can be accomplished. Certain abscesses require a more immediate performance of this operation than others, and more particularly the following:—1st, Abscesses proceeding from the escape, into the substance of any organ or part, of irritating secretions or excrementorial matters, as the urine, or fæcal substances. 2d, Abscesses preceded by very acute inflammatory action, and occurring in cellular or adipose structures, as the margin of the anus, the sides of the neck, or the groins. 3d, Purulent collections deeply seated, or confined under fasciæ or aponeuroses. 4th, Abscesses formed in the parietes of the splanchnic cavities, in order to prevent the chance of their breaking internally. 5th, Abscesses formed in parts through which large nerves and blood vessels pass, and on which the purulent matter occasions a painful and injurious pressure; as abscesses in the neck, and underneath the sterno-mastoid muscle, at the top and inside of the thighs and arms, &c. 6th, Abscesses which embarrass the respiratory organs, and which press upon the larynx, pharynx, or trachea, or which endanger the integrity of those parts.

64. In all these the strict antiphlogistic treatment will be requisite, unless they are of the diffusive or consecutive kinds, with emollient applications, in order to limit the extent of the inflamed parts, to diminish their size, and to hasten their maturation; and in many cases this mode of treatment must be continued for a considerable time after the discharge of the matter, in order to limit or prevent its re-accumulation, and to promote the collapse and diminution of the parietes of the abscess. The cases where it will be frequently necessary to retard the period of discharging the purulent collection, are chiefly those in which it is formed in the internal viscera, as the liver, spleen, kidneys, lungs, &c.; respecting which I have treated fully under their appropriate heads.

65. Chronic abscesses should be opened as soon as it is shown that their absorption cannot be accomplished; or when they augment in bulk under the discutient and derivative treatment. Symptomatic abscesses also require to be opened, when we find that the means which we have directed to the original seat of disease fail of limiting their extension, or lessening their bulk. Consecutive abscesses require to have their contents immediately discharged, when their situation admits of this being done; for the morbid state of the matter they sometimes contain, and the weak vital resistance opposed by the surrounding parts, and by the constitution, favours the contamination of the adjoining structures, and, indeed, of the whole frame. But this intention can seldom be fulfilled, owing to the seat of the purulent collection; and, when it is put in practice, it should be followed by as complete an exclusion of the atmospheric air as possible.

66. It does not come within the scope of this work to notice, at this place, the different modes of opening abscesses, and the treatment with which the operation should be accompanied and

have reason, moreover, not only to infer that the more material causes of disease are absorbed from the surface of the lungs, when inhaled into them with the atmosphere, in the moisture of which they are dissolved, or otherwise combined; but, also, that the foreign gases, which sometimes mix with the air, act in some measure through the same channel.

6. The organisation of the respiratory surfaces, the nature of the circulating functions on these surfaces, and the more immediate relation subsisting between the air in contact with, and the blood circulating in, them, will readily explain the rapidity with which foreign matters floating in the atmosphere are frequently conveyed into the circulation. Besides, we have strong reasons to infer that several of the gases, and of the soluble substances which float in the air, are carried directly into the blood from the surface of the lungs, without passing along absorbent vessels. The experiments of Professor MAYER, and of Drs. LAWRENCE and COATES, as well as those of MM. SEGALAS, FODERA, &c., fully confirm this inference; whilst those performed by MM. MAGENDIE, SEILER, FICINUS, TIEDEMANN, GMELIN, and several others, show, that even in the alimentary canal, and especially when capillary vessels are divided in any of our tissues, the function of absorption is not confined to lacteal or lymphatic vessels, but is frequently extended to the venous capillaries, which, in respect of certain substances particularly, chiefly perform this function. Hence I may conclude that foreign substances dissolved in, or combined with, the moisture of the air, or mixed with this fluid, may, when inspired, be carried from the surface of the lungs into the blood, independently of the absorbent vessels; although, doubtless, these vessels perform their appropriate functions in this as in other parts of the body.

7. *b.* The rapidity of absorption in the lungs, and the ready access to the blood which foreign matters find through them, are sufficient to vindicate their importance as channels through which to convey our means of cure, not only in those maladies to which they are liable, but also in a number of diseases affecting the whole frame, or particular parts of it. General suggestions on this subject are all that can be advanced in this place; the particular recommendations for its use are given in their appropriate places. Those gaseous bodies which possess active medicinal powers; all those remedies which are more or less volatile, or are soluble in aqueous vapour; and many medical substances which may be rendered volatile or soluble in water, when combined with other bodies that do not destroy altogether their remedial powers, may be prescribed advantageously through the medium of the lungs. Chlorine, the nitrous oxide, dilute oxygen gas; the vapour of iodine, or the sulphuret of iodine; the vapour of turpentine, camphor, of the common, the aromatic, or the pyroligneous vinegars; tar vapour; the chlorides or chlorurets of lime or of soda; aqueous vapour holding the active principles of opium, henbane, hemlock, belladonna, digitalis, colchicum, &c. in solution; the volatile principles of various salts, the aroma of a number of vegetable bodies, — all exert powerful effects upon the system when administered in this way.

8. *c.* Through this channel a number of fevers, especially those which are characterised by great

depression of the powers of life, or which rapidly pass into this state; various chronic affections of the lungs themselves, which are unattended by acute inflammation, but consist chiefly of a morbid state of the respiratory nerves, and are accompanied with spasm, and a morbidly increased secretion; the different kinds and forms of asphyxy; the diseases which threaten life by interrupting the respiratory functions; and various maladies in which the blood is vitiated, and where it becomes important to act in a direct and decided manner on this fluid, and on the circulating organs generally, may be successfully combated.

9. *d.* The knowledge that we thus acquire respecting the channels, through which the causes of many diseases invade the system, and the remedies for removing them may be efficaciously administered, furnishes us with important indications as to the employment of *prophylactic measures*, and rational plans of regimen and hygiene. Miasmatal or contagious fevers furnish us with numerous opportunities of proving the justness of these views. Observation shows us that the causes of this class of disease act upon the system chiefly from their presence in the air we breathe: it further enables us to decide that these causes invade the system chiefly through one of two, or perhaps by both routes: viz. by the nerves supplying the respiratory organs, or by the partial absorption of the causes themselves, from the pulmonary mucous surface, into the circulation. From the same source, or from the collateral evidence of experiment, we know that foreign substances do not so readily enter the circulation, when its functions proceed with energy, and the vital resistance is perfect, as when they act feebly and imperfectly; and that the depressing causes of disease have less power over the nervous influence of the respiratory organs, and of the system in general, when the vital actions which take place in the lungs are performed with due activity. The same sources of observation make us acquainted with the important facts, that the dilution of the atmosphere, which contains the causes of febrile diseases floating in it, by free ventilation; that the destruction, or neutralisation, or counteraction, of these causes, by the evaporation of certain disinfectant and stimulating agents; and that a due energy of all the vital and secreting functions, with an equable state of the mental powers and manifestations, and with a steady confidence, are the most successful means of preventing the attack and diffusion of those maladies.

10. By combining these facts as to the source, mode of operation, and methods of counteraction, of the chief causes of a most important class of maladies, and by directing the measures they suggest as far as may be according to the peculiarities of individual cases and diseases, we are thereby enabled to furnish persons, and even whole communities, with instructions and means calculated either to counteract or to lessen the dangers to which they are exposed.

11. *3d, Of absorption from the alimentary canal, in connection with the causation of disease.* — *a.* It may be received as a pathological axiom, that the rapidity and extent with which deleterious matters are absorbed from the digestive mucous surfaces, as well, indeed, as from the respiratory, and other organs of the body, are nearly in pro-

portion to the depression of the nervous energies and vital resistance of the system. The truth of this is evinced in respect not only of the actions proceeding on the mucous surfaces, but also of those taking place in the different organs and structures. It is necessary to allude here to the numerous agents which cause, counteract, or remove disease, by their being absorbed from the alimentary canal. Whilst many agents produce their effects chiefly by modifying the states of the nerves and mucous tissue of this canal, others act principally from being absorbed, either by the lacteals, or by the venous radicles, and carried into the circulation; and a still more numerous class seem to operate through both channels, impressing immediately the nerves and tissues to which they are applied, and subsequently being absorbed into the blood, where they produce important effects not only upon this fluid, and on the vascular system, but also upon the functions of various secreting organs, especially those by which they are eliminated from the body.

12. A very large proportion, therefore, of the ingesta, whether alimentary, medicinal, or poisonous, thus acting upon the system chiefly through the medium of absorption, the importance of directing a considerable portion of attention to this function in our pathological investigations, as well as in the appropriation of medicinal means, must be apparent. Besides these more obvious relations of the subject, there are others which have been either imperfectly investigated or entirely overlooked. To these I can merely allude: but amongst the most interesting are the absorption of unwholesome and imperfectly digested chyle from the intestinal surface; the absorption of a portion of the vitiated secretions which occasionally accumulate in the alimentary tube, particularly in the cæcum and cells of the colon; the absorption of some part of the fecal matters, when they are long retained in the above situation, as evinced by the sensible qualities of the perspiration, foul state of the skin, &c., or of the obstructed and accumulated urinary secretion, as proved by similar phenomena; the passage of bile into the circulation, when it has been retained in the liver, the biliary ducts, or gall-bladder, from torpor or obstruction of these parts, or when it is secreted in large quantity, and does not readily pass off with the excreta. All these are very fruitful sources of disease; and, although generally connected with some degree of pre-existing disorder, or of torpid function, they are often the chief aggravating causes of many of the maladies we are called upon to treat, from the constitutional and visceral disturbance they occasion and perpetuate.

13. There are few disorders which implicate the digestive and chylopoietic organs, and very few febrile diseases, which do not, at some period of their course, evince signs of the absorption into the circulation of a portion of the morbid secretions or fecal fluids retained in the alimentary canal, when due evacuations are not practised. Therefore, besides the other effects produced by medicines of this class, the due evacuation of these secretions and fecal matters from the prima via is one of the best offices they perform.

14. *b.* It is unnecessary to do more than to allude to the advantages that accrue to the scientific practitioner from some knowledge,—although, in the present state of medicine, necessa-

rily imperfect,—of the remedies which act by being absorbed, either altogether or in part, from the alimentary canal. Most of those substances which are found by experience the most efficacious in promoting the actions of the different secreting viscera, and in producing a marked and permanent change of the general state and functions of the economy, operate after having been absorbed into the circulating current, and conveyed through this channel to vital and secreting organs; and, although, during the healthy performance of the secreting functions, or whilst the vital energies are not far reduced, these substances seldom accumulate in the blood so as to be detected in it by chemical analysis, owing to the balance which is preserved between the rapidity of absorption and the activity of elimination, yet their passage through it is proved by the fact, frequently observed in regard of all of them, of their being found in the secretions of the eliminating or depuratory organs. This fact was established by experiments performed by myself,—some of them as far back as 1819,—and published in several periodicals in 1821 and 1822.

15. 4th. *Of absorption from diseased organs and structures.*—*a.* When morbid secretions are generated, or accumulated in any organ or texture, or when any part is changed in such a manner as to secrete a matter different from the healthy constituents and fluids of the body, the matter formed is generally, after a while, absorbed into the circulation, and contaminates, in a more or less marked manner, according to its nature, the other fluids, and the soft solids, and thereby at last destroys life. Illustrations of this procedure are furnished us in the pathological history of internal and deep-seated abscesses; in some morbid states of the uterus; in scirrhus-cancer, fungous hæmatodes, and other malignant diseases. The celerity with which the absorption of the morbid matter and the contamination of the frame proceed, is generally according to the principle already recognised (§ 9.),—in proportion to the diminution of the vital energy and resistance of the constitutional powers.

16. *b.* The commencement of the contamination can scarcely be determined by an appreciation of symptoms: but the experienced observer will readily recognise, in the colour of the surface of the body; in the state of the heart's action, and of all the circulating functions, as well as in the blood itself; in the failure of the energies of life; in the morbid condition of the nervous functions and of the powers of the stomach, and indeed of the whole digestive canal, sufficient proofs of the early, as well as of the advanced progress of disease, arising from the absorption of morbid matters from the primary seat of morbid action, and the consequent vitiation of the circulating fluids, of the soft solids, and of the secretions and excretions of the body. (See *Art. BLOOD.*)

17. In many of the more chronic diseases which either commence with or terminate in the malignant state, this contamination is frequently first evinced by the tumefaction and pain of adjoining lymphatic glands, owing to the irritation produced by the morbid fluid conveyed into them: the inflammation or obstruction thus produced in them becoming an obstacle to the rapid transit of the morbid matters from the original seat of disease into the circulation. But in many cases this is an

insufficient barrier; and in others, these matters seem to pass onwards, either without circulating through lymphatic glands, or without occasioning irritation, obstruction, or inflammation in them; or are almost directly conveyed into the venous circulation. Whatever may be the channel of conveyance, there can be no doubt of the fact — the practical importance of which is very great — that the rapidity of the absorption of morbid matters, and extent of their hurtful effects on the constitution, are in proportion to the depression of the vital energies of the frame, — this depression being frequently the cause of their absorption, particularly in respect of puriform fluids; or at least the circumstance which more especially favours its occurrence, and the rapidity of its progress.

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ABSTINENCE. *Its Morbid Effects.* SYN. *Abstinencia*, Lat. *Astinensa*, Ital. *Die Enthaltung*, Ger. *Abstinence*, Fr. *Starvation from Hunger*.

CLASSIF. I. CLASS, V. ORDER (*Author*, see *Classification in the Preface*).

1. It does not come within the scope of this work to enter upon the consideration of the therapeutical relations of abstinence; but that the practitioner should be acquainted with the states of disease which it occasions, and with the best means of treating it, is extremely important; more especially as, when it is too rigidly enforced during the treatment of several diseases, it not infrequently gives rise to effects of a serious nature, which not infrequently have been mistaken for the spontaneous course of the malady.

2. I. OF THE MORBID EFFECTS OF ABSTINENCE. Abstinence has been long employed as a means of cure, and generally as a part of the antiphlogistic regimen, in a very great number of diseases, particularly in fevers and inflammatory affections. Very great difference, however, exists both among writers and practitioners as to the extent to which it should be carried, and the maladies in which it ought to be prescribed. As to its applicability to the class of diseases now noticed, there is no doubt: but in disorders of debility, or of irritation merely, particularly those which occasionally simulate chronic inflammation, and in various nervous affections, it is extremely injurious; and I believe that it has been carried to a hurtful extent in many of these affections, particularly by BROUSSAIS and his followers, as indeed has been recently well shown by MM. PIORRY and BARRAS. A case of this description, which had been long under the care of M. BROUSSAIS, very lately came before me, with many of the morbid effects of this practice, which had been carried to a hurtful extent. There can be no doubt, however, that it is extremely beneficial, when carefully watched and regulated, in many of the diseases of the stomach and its associated viscera; but the fact is equally incontrovertible, that it will often produce effects very nearly resembling those for which it has been prescribed. The importance, therefore, of keeping these effects in recollection, when treating several diseases, particularly those of irritation and debility, must be apparent.

3. In appreciating the usual effects of abstinence it is extremely requisite to be aware of two things: 1st, That the effects vary with the state of the patient at the time that abstinence is endured; 2d, that they differ materially according to the suddenness with which it is entered upon, the extent to which it is carried, and the circumstances with which it is associated. By very corpulent and plethoric persons, abstinence is generally borne well for a long period, and by those labouring under febrile or inflammatory excitement; and it is, in them, one of the most necessary means to diminish the one and lower the other. In these, particularly the latter, total abstinence may be endured for many days; whilst, if carried to the same extent in healthy persons, its effects would be fatal, or nearly so. Abstinence, also, is longer endured by persons of the middle or matured epochs of life, than by those of an early age.

4. That the absolute or sudden deprivation of food should be productive of more rapidly serious effects is very obvious; but it is not so well known that there are circumstances, which modify the effects of the less absolute states of abstinence, and which, when thus combined, give rise to very important and dangerous diseases. In order to place the subject more clearly before the reader, I will first notice the effects of abstinence simply, and unassociated with other causes of disease; and next, the morbid conditions, which its association with certain influential agents usually occasion.

5. 1st, *The morbid effects of simple abstinence* — Keeping in recollection the modifications depending upon the extent to which deprivation of nourishment is carried, and the age and state of the person at the time of its adoption, I may briefly describe the morbid effects of abstinence as follow. — Paleness and langour of the countenance; muscular debility and emaciation; a weak and small pulse; thirst; at first quickness of intellect, constipation, and flaccidity of the muscles. To these succeed increased frequency of pulse, palpitations, alternating with leipothymia, or even full syncope; headach or delirium; flashes of light before the eyes; tinnitus aurium; slight amaurosis; parched state of the throat, and thirst; pains in the stomach; great wakefulness, followed by delirium, sometimes mild, but in other cases furious, or at first mild or muttering, and afterwards strong or furious; sinking of the animal heat, or alternate coldness and burning in parts of the body; and lastly, morbid sensibility of the organs of sense and surface of the body, and greatly depressed temperature, followed by insensibility, stupor, or coma, terminating in death.

6. It is obvious that the severity and duration of these symptoms will vary in different cases, according to circumstances peculiar to each. But it is not so well known that they will be actually produced by pursuing a too rigid abstinence in the treatment of various diseases, and particularly when the nature of the disease is mistaken: as when the irritative symptoms frequently attendant upon diseases of debility, or on nervous affections, are viewed as resulting from inflammation. Many cases have occurred to me in the course of practice, where the antiphlogistic regimen, which had been too rigidly pursued, was itself the cause of the very symptoms which it was employed to remove. Of these symptoms, the affection of the head and delirium are the most

remarkable, and the most readily mistaken for an actual disease requiring abstinence for its removal. A case of this description lately occurred to me. A professional man was seized with fever, for which a too rigid abstinence was enforced, not only during its continuance, but also during convalescence. Delirium had been present at the height of the fever, and recurred when convalescent. A physician of eminence in maniacal cases was called to him, and recommended him to be removed to a private asylum. Before this was carried into effect, I was requested to see him. A different treatment and regimen, with a gradual increase of nourishment, were adopted, and he was well in a few days, and within a fortnight returned to his professional avocations.

7. *The morbid appearances* observed after fatal cases of deprivation of food possess some interest. The most remarkable are the emaciation and absorption of every particle of fatty matter: the paleness, flabbiness, softening, and emaciation of the voluntary muscles, and of the substance of the heart; an exsanguined and pale state of the viscera; slight atrophy of the liver and spleen; diminished size of the stomach and colon; and particularly the increased vascularity of the brain, and sometimes of the membranes also, compared with the other viscera. It would seem that a very large proportion of the blood continues, as in many cases of great vascular depletion, to be sent to the brain to the very last. This is obviously owing to the pressure of the blood on all parts of the body, from which the encephalon is guarded by its unyielding case. In addition, also, to the vascularity of this part, a limpid serous effusion between the membranes, or in the ventricles, is sometimes met with.

8. *2d, Of the morbid effects of abstinence when it is associated with other hurtful agents.*—These effects are occasionally presented to medical men under a variety of circumstances, and from a varied combination of causes; but in the great majority of instances they result from deficiency of food merely, rather than from a rigid abstinence, conjoined with the depressing influence of cold or insufficient clothing, great or continued exertion, or with a moist and unwholesome atmosphere. Thus we find the association of these causes, particularly insufficient or unwholesome food, laborious exertion, mental depression, a moist, cold, or unwholesome atmosphere or locality, not infrequently give rise to purpura hæmorrhagica, scorbutic dysentery or diarrhoea, low or typhoid fevers, affections of the brain and nervous system, emaciation, with chronic ulcerations, &c.—effects which have received a particular notice in their respective articles.

9. The best illustration of the effects of this association of other agents with a continued deficiency of food is furnished by the diseases which appeared a few years ago in the Milbank Penitentiary. The prisoners confined in this prison were suddenly put upon a diet from which animal food was nearly altogether excluded, excepting in as far as it entered into the composition of a weak soup. They were at the same time subjected to a low grade of temperature, to considerable exertion, and confined within the walls of a prison situate in the midst of a marsh which is below the level of the adjoining river. The consequences were, first, the loss of colour, of flesh and

strength; subsequently, diarrhoea, dysentery, scorbutic dysentery, scurvy; and, lastly, low ataxic or adynamic fevers, or headach, vertigo, convulsions, delirium or mania, apoplexy, &c. The smallest loss of blood produced syncope or leipthymia, and fatal results. Yet, in the great majority of the fatal cases, independently of the lesions observed in the mucous surface of the digestive tube, or in other situations, increased vascularity of the brain and its meninges, frequently with effusion of fluid in the ventricles or between the membranes, was found upon examination after death.

10. II. The TREATMENT of the morbid effects of abstinence is very obvious, yet considerable care is necessary to its successful issue in very urgent cases. Nourishment should be administered cautiously, in a very small quantity at a time at first, but frequently. It ought to be bland and farinaceous: animal food may be entered upon subsequently, and the quantity gradually increased. The animal warmth should be promoted, at the same time, by the usual external means—by frictions and warm applications; and the bowels assisted by the occasional use of bland enemata. Soups may be allowed early in the treatment, but in a small quantity at a time. Milk is often prejudicial, unless diluted and made into gruel with some of the farinaceous articles of food. Internal stimulants are seldom required, unless when symptoms of cerebral or nervous irritation exist, when they may be given; particularly the preparations of ammonia, the æthers, camphor, vegetable bitters and tonics, at first in very moderate doses, in conjunction with small quantities of an anodyne, as the extract of hop, the extract of hyoscyamus or of opium, the paregoric elixir; and by warmth, frictions, and stimulating applications to the cutaneous surface and lower extremities. These means will generally succeed in removing the effects of simple abstinence whilst they admit of removal. The treatment of the effects resulting from the conjunction of other causes with the one now discussed, is considered under their respective heads.

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ACNE. *ἄκνῃ*. Derived, according to Cassius (*Nat. et Med. Quest.*, &c., Prob. 33.), from *ἀκνῆ*. SYN. *ἰσθός*, Gr. *Varus*, Lat. *Psudracia Acne*, Sauv. *Gutta Rosea*, Darwin. *Ionthus*, Good. *Bouton*, *Couperose*, Fr. *Dio Finnen*, Ger. *Carbuncle*, *Stone-pock*, *Whelk*.

CLASSIF. 3. Class, Diseases of the Sanguineous Function; 2. Order, Inflammation (Good); 7. Order, Tubercles (Willan and Bateman). IV. CLASS, IV. ORDER (Author, see the Classification).

1. DEFIN. Hard, inflamed, tubercular tumours, suppurating very slowly, occurring chiefly in the face; sometimes, also, on the neck and shoulders.

2. I. DESCRIPTION. One or more, sometimes a number, of these tubercles appear, generally in succession, in the face, and sometimes on the neck,

shoulders, and breast, but never lower; remain permanent for a considerable time; and suppurate slowly and imperfectly, leaving a dark or livid mark, which gradually disappears. They occur chiefly in persons of the sanguine temperament; commencing at the period of puberty, and generally disappearing after thirty or thirty-five. They are common to both sexes, but are most frequent and numerous in the male sex.

3. This is one of the most constant and unvarying in its characters of any of the affections of the skin; but writers upon this class of diseases differ widely in respect both of its particular character and seat. WILLAN, PLENCK, BATEMAN, and THOMSON consider it a tubercular affection; whilst ALIBERT, BIETT, and RAYER view it as pustular. I believe, however, that both opinions are in some respects correct; and that in certain forms or states of acne the tubercular change is predominant, little or no suppuration taking place, but a state of slow inflammation giving rise to a continued exfoliation of the cuticle, or formation of thin scabs on their apices; and thus they slowly disappear; whilst in others the pustular character is very distinct, but always preceded by the characteristic tubercular hardness. This affection may be viewed, therefore, as forming an intermediate link between the tubercular and pustular eruptions.

4. In respect of the particular tissue in which this disease is seated, some difference of opinion also exists. The greater number of writers on the pathology have considered this disease to be seated in the proper structure of the cutis vera; many of them admitting, at the same time, an affection of the sebaceous follicles very nearly resembling it. Mr. PLUMMER, however, attributes it entirely to obstruction and chronic inflammation of these follicles. I believe that this opinion is too restricted; and that, whilst one form of acne evidently depends upon this cause, others are essentially disease of the cutis vera.

5. Spec. i. ACNE SIMPLEX, *Simple Acne*. Syn. *Gutta Rosea Hereditaria*, Darwin. *Dartre Pustuleuse Miliare*, Alibert. *Ionthus varus simplex*, Good.

Simple acne affects most frequently young subjects at the period of puberty, and particularly females. They generally appear on the forehead, shoulders, and upper part of the thorax, and are liable to recur at the menstrual periods, especially in cases of dysmenorrhœa. Many of these vari do not proceed to suppuration, but slowly subside. They are very commonly developed in succession; commencing with small, hard, and inflamed tubercles, of the size of a pin's head. These continue to enlarge for three or four days, and the inflammation becomes more apparent. In seven or eight days they have reached their greatest size. They are then dark red, smooth, prominent, shining, hard, and slightly painful to the touch. After two or three days a small speck of matter appears on the apices of some of them; and when these break, a thin humour exudes from the tubercular induration, and dries on its surface, forming a thin scab, which adheres firmly; but, after a few days, is loosened at the edges, and falls off; the tubercular hardness and livid redness gradually subsiding, and disappearing after three or four weeks.

6. In some persons this eruption recurs fre-

quently at short intervals, the vari being more or less numerous; in others it is more extensive, and never altogether disappears, although it is more troublesome at one time than another. When the vari are numerous, many of them undergo no suppuration; but the sebaceous glands are often excited, giving the skin a greasy appearance. In many of these cases, several of the vari assume the characters of the next species.

7. Spec. ii. ACNE INDURATA, *Stone-pock*.

The tubercles are larger, more indurated and permanent than the foregoing; and are apparently the consequence of a slower and more deep-seated inflammation. They often appear in considerable number, of a conical or oblong-conoidal form; some of them assuming a roseate hue, and tending to suppuration at their apices; others remaining in a hard, elevated state for a very long time, without any appearance of the suppurative process, or disposition towards it. In some cases, two or even more of them coalesce, and occasionally suppurate at their respective apices; but one only may undergo this change. As they continue they become more purple or livid, particularly when they have no tendency to suppurate. When they experience this process, the same process of scabbing and exfoliation, already described (§ 5.), is gone through; but it sometimes happens that when they experience any irritation they may suppurate a second time. As they very slowly subside, they leave a purple or livid discoloration, and, occasionally, a slight depression, which is long in wearing off, and which sometimes never altogether disappears.

8. This species of acne generally is most frequent and numerous along the rami of the lower jaw, on the temples, the nose, and cheeks; also on the back and neck. They are frequently accompanied by a greasy state of the skin, from an excited state of the cutaneous follicles; are commonly sore and tender to the touch; and, when numerous, are in every stage of progress, giving the surface a spotted and variegated appearance,—owing to the prominence and redness of some at their commencement, to the yellow points in those that are suppurating, to the scaly crusts covering those which have undergone this process, to the lividity of those that have exfoliated or are subsiding, and to the discoloured depressions which others have left after them.

9. The general health seldom suffers materially from either the simple or the indurated acne, excepting as far as regards some pre-existing and concomitant disorder of the digestive functions. If fever, or acute disease, attack persons affected with these eruptions, the vari generally disappear; but they frequently also re-appear upon its subsidence, becoming in some respects a critical eruption.

10. Spec. iii. ACNE ROSACEA, *Rosy-drop*. Syn. *Gutta Rosea*, Auct. var. *Gutta Rosea Hepatica*, Darwin. *Ionthus Corymbifer*, Good. *Dartre Pustuleuse Couperose*, Alibert. *Goutte Rose*, *Couperose Rougeurs*, Fr. *Kupferbandel*, *Roth-nase*, Ger. *Carbuncled Face*, Eng.

The first and second species, described above, might have been, with propriety, viewed as varieties of the same species; but this is a very distinct species from the preceding. It consists of small, slowly suppurating tubercles, accompanied

and excitement, or an imperfect performance of the uterine functions; by constipation; by torpid conditions of the liver; and by the injurious addiction to onanism.

17. V. TREATMENT.—In the treatment of these affections, our chief attention ought to be directed to their pathological relations and causes. These latter must be removed as far as may be done; and the former should both guide our indications, and direct our means of cure. The apprehensions entertained by the older writers, of producing internal disease by the sudden repulsion of the eruption, were founded on the results of observation, although explained by partially inaccurate or unsound pathological views. Affections of the stomach, bowels, chest, and head, have been thus induced, and been relieved upon a re-appearance of the eruption: but such consecutive diseases are more common after the repulsion of other eruptions. We should, however, as being both the safest and the most permanent method of cure, direct our remedies to the constitutional or internal relations, as well as to the external manifestations of disorder.

In the treatment of this, as well as many other diseases, the causes, the state of the habit and constitution of the patient, its morbid relations, and its duration, are severally to be kept in recollection.

18. 1st, *Treatment of acne simplex*.—In delicate constitutions, the chief attention should be directed to the state of the digestive functions. These should be promoted by gentle *aperients*, combined with *tonics*, and the functions of the skin promoted, by preserving a free transpiration on its surface. With this view, *sulphur* may be combined with *magnesia*, or with cream of tartar, and confection of senna, and taken in a sufficient dose, at bedtime, to procure a full evacuation in the morning, or any one of the formulæ (Ap. Nos. 82. 89. 98.) may be had recourse to. These may be occasionally changed for a powder with rhubarb, sulphur, and *magnesia*, or for the extract or decoction of *taraxacum*, with carbonate of soda or sulphate of potash. If the functions of the liver are torpid, the following may be taken for a few nights:—

No. 6. R. Pilul. Hydrarg. Chloridi Comp. ʒj.; Fellis Tauri Inspiss. gr. xv.; Saponis Castil. gr. x.; Extr. Taraxaci ʒj. M. Fiat Pilulæ xviii., quarum capiat binas vel tres horâ somni.

After the bowels have been evacuated, and the secretions brought to a healthier state, the dilute *mineral acids*, either alone or with *bitter infusions*, may be taken through the day.

19. When the eruption occurs in young plethoric persons, and when it is in females attended with scanty and difficult menstruation, small *blood-lettings* may be practised; in the latter, by the application of *leeches* to the superior and internal parts of the thighs. In more delicate females the functions of the lower bowels are to be promoted by the pilula aloës cum myrrha, combined either with pilula ferri composita, or with the extractum gentianæ. When the eruption is obviously connected with imperfect and painful menstruation, the use of the warm salt water *hip-bath*, or of the hip vapour bath, or warm salt water *pediluvia*, after the application of a few leeches to the insides of the thighs, will be extremely serviceable. In such cases, the internal exhibition of the *biborate of soda*, either in the form of pill or draught,

combined with camphor, the extractum taraxaci, or the extr. rutæ, or, as directed in Form. Nos. 93. 184. 209. 254. will be found of great advantage.

20. In addition to these internal remedies, which require to be varied according to different pathological relations of the eruption, external applications will be necessary; and when conjoined with the above treatment, or employed subsequently to it, no dread may be entertained of any injurious consequences from them. The ancients, particularly CELSUS, PLINY, AETIUS, PAULUS, ACTUARIUS, &c. recommended lotions and liniments with vinegar and honey; and these sometimes combined with turpentine, emulsion of bitter almonds, myrrh, alum, soap, Cimolian earth, the bruised roots of the lily, the cyclamen, narcissus, and the fruit of the wild vine; the most of them calculated to be advantageous in many states of the common forms of acne.

21. If the tubercles are much inflamed, and inclined to be pustular, mildly stimulating applications are most serviceable, as *dilute spirit*, or the *pyroligneous acetic acid*, or *liquor ammoniæ acetatis*, with rose or elder-flower water. In the more indolent cases, or when the skin can bear an augmented stimulus, WILLAN and BATEMAN recommend from half a grain to a grain, or more, of the *bichloride of mercury*, in each ounce of the vehicle; or a drachm or more of the *liquor potassæ*, or of the *hydrochloric acid*, in six ounces: and THOMSON advises that the emulsion of bitter almonds, containing ten minims of *hydrocyanic acid* to each fluid ounce of the emulsion, should be the vehicle adopted. The solution of the *sulphuret of potassium*, in the proportion of a drachm to twelve or sixteen ounces of water, may also be employed; and, in the more obstinate cases, the *baths* directed in Form. No. 14—17. may be had recourse to. The solution of the *hydrochlorate of ammonia*, either alone or with the bichloride of mercury, is often serviceable.

22. The lotion from which I have derived the greatest advantage in practice, and which I have found the most generally applicable, is a solution of the *biborate of soda* in rose or elder-flower water, or in water which had been poured in the boiling state over sulphur, and allowed to infuse for ten or twelve hours. The borax may also be dissolved in equal quantities of elder-flower water and honey, and used as a lotion in the more chronic cases.

23. 2d, *Treatment of acne indurata*.—In young and plethoric subjects, or in females, when the eruption is accompanied with a scanty and painful menstruation, the treatment already pointed out (§ 19.), should be put in practice. When we suspect that sexual irritation or masturbation is connected with the causation of the eruption, early rising, mental occupation, the use of gentle cooling aperients, of soda combined with small doses of camphor, soda water, sulphur with soda or antimony, are the most serviceable internal remedies. After these, the mineral acids, the sulphureous mineral waters, and gentle vegetable tonics, will be useful. Where the eruption is dependent upon torpid function of the stomach, or liver, or bowels, mild alteratives, exhibited at bedtime, as the pills already prescribed (§ 18.), and gentle tonics through the day, will be required. In a most obstinate case, which some time ago came before me in a lady, whom all the prac-

very quick, and the powers of the latter fail, that much dreaded state of the frame, which is insufficient for the formation of coagulable lymph, may be considered as approaching, if it be not actually present. In all cases where blood-vessels are liable to be inflamed, this state of the constitutional powers, owing to the risk of the blood being vitiated, is particularly to be guarded against. Having advanced as much as belongs to my province respecting the reparative states of adhesion, I proceed to state briefly the doctrine of *Morbid* adhesions. The particular morbid adhesions are noticed under the articles on the pathology of the parts in which they form.

10. Adhesions in some one of the states described above (§ 1—4.) are liable to occur, as a consequence of certain grades of inflammation, in the following situations:—1st, In the cellular tissue; 2d, Between serous surfaces; 3d, Between mucous surfaces; 4th, Between synovial surfaces; 5th, In the internal surfaces of blood-vessels; and, 6th, Between the surfaces of morbid or accidental formations.

11. *A. Adhesions of Cellular Tissue.*—The first step of the process is the exhalation of a quantity of yellowish serum and of coagulable lymph into the cellules of this tissue, which ultimately agglutinates them together, upon the absorption of the former, and the condescence of the latter. The consequence of this is, that the product of inflammation formed in the centre of the inflamed cellular tissue, consisting chiefly of the more fluid and least concrescible portion of the exhalation, is prevented from permeating the agglutinated cellules, and a barrier is set up against it. If resolution takes place and the purulent matter is absorbed, the surfaces of the cavity become united, and the medium of union is changed, as in cases of recent wounds, and in the manner described above (§ 5.). If the parts go on to the evacuation of the matter, adhesion is also effected, as in the case of consecutive restorative adhesion (§ 7.); leaving, however, a cicatrix, which is gradually diminished, formed of the cellulo-fibrous medium of union. In all cases of inflammation of cellular tissues, adhesion of the cellules, from the exudation of a concrescible lymph, takes place; and it is this adhesion which forms the fibrous cysts to abscesses, isolates their contents from the surrounding structures, and in some respects excludes them from the economy. Adhesions of the cellules of this structure also strengthen the cysts of aneurisms, and form sero-fibrous cysts around foreign bodies that are accidentally lodged in it.

12. *B. Adhesions between serous surfaces* are the next most common; being formed through the medium, either of a more or less thick and firm inorganic albumen, in the form of a false membrane, or of this substance advanced to a more or less organised state, and assuming either the appearance of cellular tissue, with a surface partaking of the serous character, or one of the states about to be noticed. The organised nature of these adhesions has been denied by some; but the observations of STOLL, HUNTER, DUPUYTREN, BAILLIE, MECKEL, HOME, LOBSTEIN, CRUVEILHIER, GENDRIN, BARON, and others, who have traced blood-vessels in them, have put the question at rest. Adhesions occur most frequently between the pleura, next in the peritoneum, and

next to these in the pericardium. They are comparatively rare in the tunica vaginalis; and in the arachnoid they are still more rare.

13. It is not necessary to the formation of adhesions between opposite serous surfaces, that the pre-existing inflammation shall extend continuously to both. When the coagulable lymph is thrown out upon one of the two inflamed surfaces,—as, for instance, on the peritoneal surface of the small intestines,—it seems to act as an irritant to the opposite part of the omentum, with which it is brought in contact, inducing inflammation of that part only, and leaving the intervening surface both above and below it unaffected. The part thus irritated by the contact of the coagulable lymph, poured out by the part primarily affected opposite to it, becomes also inflamed, and exudes this concrescible fluid; and the inflammation thus secondarily induced in a part of the omentum, may advance to the external surface of the omental duplicature, and, by means of the exudation of this product of inflammation in that situation, excite a similar state of action in the directly opposite part of the peritoneum reflected over the abdominal parietes. Thus the inflammation and its consecutive adhesions may proceed, without the disease having affected any of the continuous surfaces intervening between them. A similar circumstance is sometimes observed in respect of the convex surface of the liver and peritoneal surface of the diaphragm. Inflammation, commencing in a part only of the former, will excite it in the part of the latter exactly opposite, and be followed by adhesion; and the inflammatory action, not infrequently extending upwards through the diaphragm to the diaphragmatic pleura, will be further followed by the exudation of coagulable lymph on its free surface, which, irritating that portion only of the pulmonic pleura opposite to, or in contact with it, will inflame that part, and form adhesions with it, without affecting the continuous surface intervening between, and surrounding the adherent parts. The unadhering cavity, however, not infrequently contains a turbid or flaky serum, with patches of false membrane, arising from a less acute state of inflammatory action in those parts of the serous surface immediately adjoining the adhesions. Thus it is not unusual to find, in cases of acute inflammation affecting either the peritoneum, pleura, or arachnoid, and limited to a particular part, a similar state of disease, and the same product, formed only in the parts opposite, and most nearly in contact; whilst the continuous surfaces surrounding them are either altogether sound, or much less affected;—most commonly only so far as to give rise to a serous exudation, or slight albuminous coating, in their immediate vicinity.

14. From this it will appear, that the near approach, and more especially the immediate contact, of opposite surfaces, and the want of motion between the one surface and the other, will favour the formation of adhesions: thus they are most frequent at the superior parts of the pleura, between the convex surface of the liver and the diaphragm, and the serous surfaces of parts included in hernia. The different species of media, by which adhesions of serous surfaces are affected, are the following, according to M. CRUVEILHIER:—An inorganised false membrane; a filamentous adhesion, and a cellular adhesion,

This may be viewed as the primary form of their adhesions, and its usual results. When, however, suppuration takes place in their internal surface, the adhesion is formed consecutively in the manner described above (§ 7.); or the primary may pass into the consecutive form of adhesion, particularly when the false membrane is insufficient to fill up the entire canal of the vessel.

19. Adhesions take place more readily in veins than arteries; are produced in both, and in lymphatics also, in the manner now stated, generally in consequence of inflammatory action, attended with sufficient power of the constitution to form concretescible lymph (see the articles on ARTERIES and on VEINS); and sometimes, even after a very slow and slight grade of this action, when the opposite surfaces of the vessels are pressed together by any tumour existing exteriorly to them. When artificially excited in arteries, as by the application of ligatures, the inflammatory state which produces the adhesion is not so prone to extend along the axis of the vessel, or to occasion dangerous effects, as when it is excited in the same way in veins. When thus produced in these latter vessels, fault of constitution, an unhealthy habit of body, unwholesome state of the atmosphere, &c., or the other causes above assigned (§ 8.), will generally interfere with the process, and occasion that state of morbid action, and of its products, which will vitiate the current of the circulation, and even destroy life. (See VEINS—*Inflammation of.*)

20. F. Adhesions of the internal surfaces of cysts, and other morbid formations, sometimes take place from a consecutive state of inflammation extending to them. Large cysts, which in consequence of their situation cannot be removed, may be obliterated by their puncture, and the production of inflammation of their internal surfaces, so as to procure their adhesion.

21. G. Adhesions may also form between parts of the cutaneous surface, when deprived of the cuticle, and kept in close contact. This is not infrequent after scalds and burns, and is produced in a similar manner, as I have explained, in respect of adhesions taking place primarily, and without suppuration, or subsequently to the occurrence of this process in the cellular and mucous tissues. Adhesions also occur in other situations, as between the iris and capsule of the crystalline lens, &c.; but I have noticed those which more especially belong to my province.

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ADIPOSE TISSUE.—*Tela adiposa*, Lat. *Tissu graisseux*, Fr. *Das Fett*, Germ.—Its MORBID STATES.

CLASSIF.—IV. CLASS, IV. ORDER (*Author, see the Preface*).

1. The adipose substance is frequently either *diminished* or *increased* far beyond the healthy standard.—A. Excessive diminution of this substance, *atrophy*, occurs naturally in very aged persons; and there seems to be, even in early life, a tendency to it hereditarily in certain constitutions, particularly in those of a peevish, anxious, and irritable temper. It is often met with as a consequence of, or conjointly with, pulmonary and other organic diseases, particularly those which interrupt assimilation and the supply of nutrition. But it is also a symptom of all diseases, which impair the vital energies by morbidly increasing the secretions and evacuations; as in diabetes, diarrhoea, and dysentery. It also necessarily proceeds from long abstinence, &c.

2. Atrophy of this substance may be temporary or permanent. It is usually the former in early or middle life, and continues merely as long as the causes which occasioned it. It is usually permanent in advanced life, and in those of an active, peevish, restless disposition. In every case the removal of the fatty matter is produced by absorption; and, according to the experiments of MAGENDIE, TIEDEMANN, GMELIN, MAYER, &c., this process may be ascribed, at least in part, to the minute veins. The circumstance of fatty and oily matter being constantly found in the blood, but in variable quantity, as shown by TRAIL, BABINGTON, LE CANU, &c., seems to support this view; for, if taken up by the absorbents, it may have been changed or assimilated in its passage through the absorbent glands before it could have reached the blood.

3. B. Excessive deposition or hypertrophy of this substance (*adiposis*) is very common, affecting the body generally, but sometimes locally only. Persons have weighed as much as 500 or 600 lbs. owing entirely to this state of hypertrophy. This tissue is naturally abundant in females and eunuchs. Its hypertrophy is frequently occasioned by excessive venereal indulgences, particularly in early life, and when conjoined with high living and indolence. It generally is attended by a weak languid circulation, weak digestion, with craving appetite, defective secretions and excretions, and disinclination to active mental or physical exertion. It also evinces a marked hereditary character. Full living, particularly on food which abounds with the elements of the fatty substance, as sugar, spirituous and malt liquors, &c., tend greatly to promote it. The connection of this morbid state with deficient assimilation appears fully proved. It would seem that in persons whose vital energies are diminished, whilst the appetite remains unimpaired, or is excited by stimulating liquors, &c., the sanguification of chyle does not take place so rapidly nor so perfectly as in health; that a large portion of this fluid assumes an oily or fatty character, and is deposited in the adipose tissue, which thus becomes one of the emunctories of the frame, in which a substance that cannot readily be carried out of the circulation by any other organ is set apart for the purpose of future absorption, assimilation, and nutrition, as the wants of the system may require, and to prevent its hurtful accumulation in the circulating fluid. Thus, in persons otherwise apparently healthy, the excessive accumulation of fat is often one of the earliest and most remark-

able signs of diminution of the vital energies of the frame. (See art. OBESITY.)

4. C. In many instances, when the powers of the constitution are either greatly reduced or otherwise perverted from the healthy state, the adipose matter is also changed in colour, composition, and consistence, becoming remarkably pale, or dark, reddish, or gelatinous. It may likewise be, particularly in cachectic persons, uncommonly watery, soft, smeary, or jelly-like; and, on the contrary, but more rarely, hard, waxy, or even horny.

5. D. It may be a question whether or not this tissue is liable to inflammation. Considering it merely as a modification of the cellular structure, chiefly in as far as it contains the fatty substance of the body deposited in its areolæ, the containing tissue only must be looked upon as that which is liable to inflammation or any other disease; the fat or contained matter being entirely passive, and modified only by the morbid states of the tissue which secretes and contains it. There seems little doubt that the adipose tissue participates in the various states of diffuse inflammation; whether that attending upon certain forms of erysipelas, or following accidents, or the inoculation of morbid matter. When thus inflamed, it rapidly passes into a state of sloughy and fetid suppuration; large portions of it being not infrequently converted into an ash-coloured, semifluid pulp, mixed with shreds of cellular tissue and albuminous matter, or becoming entirely sphacelated.

6. E. Effusion of blood into the adipose tissue occurs under similar circumstances to those connected with hæmorrhage into the cellular substance, but much less frequently. This change has been occasionally noticed by HUXHAM, CLEGHORN, CRAIGIE, and by myself and others, in scorbutus, purpura hæmorrhagica, and in the luescent or malignant forms of remittent fever in warm or unhealthy climates.

7. F. Of the tumours most frequently developed in this tissue, the most remarkable are—*a. Adipose sarcoma*, which is surrounded by a thin capsule of cellular tissue condensed around it, and consists of an unusual accumulation of fatty matter in cells, the component fibres of which are so firm as to give consistence to the tumour: it closely resembles a local hypertrophy of the adipose tissue, excepting that it is surrounded by a capsule; and it may have either a broad or narrow base;—*b. Steatomatous* tumours are chiefly a peculiar modification of the fatty secretion, which is accumulated in masses, surrounded by a spheroidal cyst: they are not formed of cells, in which the fatty matter is deposited, but consist of a simple semifluid substance secreted by the inner surface of the cyst: they occur more frequently in the cellular, than in the adipose tissue;—*c. Atheromatous* and *melicerous* tumours are either modifications of the steatomatous, or proceed from the change induced in small chronic abscess; but they are most commonly the former when seated in this tissue.

8. G. Melanoid deposition is sometimes found in both the internal and external adipose substance. It may be either disseminated in the form of small dark spots, or accumulated in spheroidal masses; or found in a semifluid state and brownish black colour, surrounded by a cyst formed by the condensation of the contiguous cellular tissue. As to the state in which this peculiar matter is formed,

great diversity of opinion exists. LAENNEC supposed that it is first secreted in a solid form, and, like tubercular deposits, afterwards becomes soft. I am, however, inclined to adopt the opposite opinion; viz. that it is secreted in a fluid or semifluid state, and that it afterwards becomes firm by the absorption of its more fluid parts. The observations of Drs. CULLEN and CARSWELL, and of M. CHOMEL, seem to confirm this opinion.

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AFTER-PAINS. SYN. *Parodynia Secundaria Dolorosa*, Good.

CLASSIF.—5. Class, 3. Order (Good). II.

CLASS, III. ORDER (Author).

1. DEFIN.—Pains, more or less severe, either continuing or supervening shortly after the expulsion of the placenta in child-birth.

2. I. SYMPTOMS and DIAGNOSIS.—Attacks of pain in the abdomen are usually experienced in the early part of the puerperal state. They proceed, when very severe, from the contraction of the uterus, irregularly excited by the presence of coagula. They usually soon follow delivery, are least severe after a first labour, are increased upon the application of the child to the breast, and last for a day or two. They are generally aggravated by flatulence and costiveness.

3. It is extremely requisite for the young practitioner to be on his guard respecting the nature and seat of pain after delivery, as the commencement of the most fatal diseases to which the sex are liable may be mistaken, if not carefully observed, for after-pains. These latter are the result of the natural contractions of the womb, and of its return to its former state; and are distinguished from disease, particularly inflammations of the uterus, ovaria, or pelvic peritoneum, by their remissions, and by the absence of tenderness or tension of the abdomen, especially on pressure. The uterine discharge, also, is not obstructed; the milk is secreted; there is no shivering nor vomiting; and the pulse is seldom increased in frequency.

4. When the patient's bowels have been neglected previously to confinement, and when much flatulence exists, the after-pains are often complicated with colic, or they assume a colicky character. In cases of this kind, the abdomen is often somewhat more tense and distended than usual; the fits of pain are severe, with complete remissions; the patient complains of flatulence; the bowels are constipated: but the pulse is not much affected; the skin, particularly of the trunk, is not hot; the tongue is moist; and the feet are often cold; in a few cases there is retching. It is important to attend carefully to the character of pain consequent upon delivery, and to consider it in relation to the attendant symptoms, particularly the states of the pulse, and of the abdomen. We ought, therefore, to inquire into its exact seat, examine the pained part carefully with the hand; and, having ascertained in what manner it is affected by the examination, we readily arrive at just conclusions as to its nature. When it is felt in the regions of the uterus and ovaria, and accompanied by great fre-

quency of pulse, disorder of the lochial discharge, tenderness, and fulness of the hypogastric region, &c., the existence of the inflammatory diseases of the uterus, and of its appendages, are to be inferred. If it be complained of about the groin, it may be the forerunner of phlegmasia dolens; and if it be felt about the hip, or in the muscles of the pelvis, abdomen, or thighs, it may be rheumatic, owing to the application of cold in some form or other. The pains of rheumatism are readily recognised from their seat, their aching or gnawing character, the manner of their affecting the motions of the part, and the attendant symptoms. The diagnosis, however, of these diseases is fully pointed out under their respective heads.

5. II. TREATMENT. — The exhibition of an anodyne, with attention to the state of the bowels subsequently, has generally been considered sufficient for the relief of after-pains. In the more severe cases, an anodyne liniment has been recommended to be applied to the abdomen, in addition to the exhibition of a dose of laudanum internally; and, in protracted cases, Dr. Burns advises a purgative — certainly the best part of the treatment usually resorted to. I am, however, of opinion, from remarking the results of this practice, that the common or less urgent cases would have been better left to nature; and that friction of the abdomen merely with any of the liniments in the *Appendix* (F. 297, 298.), or friction followed by a purgative, or an enema, is all that is necessary. We ought to recollect that these pains are merely the result of the healthy tonic contractions of the uterus upon the congested veins, and the coagula remaining in it, occasioning their expulsion, and the discharge of the blood accumulated in its sinuses; and that the more effectually these ends are accomplished, particularly in unhealthy situations, and lying-in hospitals, the less risk there will be of the occurrence of dangerous forms of puerperal disease.

6. Whilst, however, anodynes allay the morbid sensibility of the uterus, they tend to diminish its tonic contraction, to induce a congested and relaxed state of its parietes and mouth, and to favour the admission of air into its cavity. Air, when admitted, particularly under certain circumstances, is productive of the most dangerous results, from its effects upon that portion of the surface of the womb to which the placenta was attached. Impressed with the justness of this view, I have usually recommended frictions with liniments over the region of the uterus, and a purgative, or purgative injection, which will tend essentially to favour the contraction of the uterus, and the expulsion of the cause of irritation.

7. In cases complicated with flatulency and colic (§ 4.), the above means are still more requisite; but much will depend upon the choice of purgatives. My own experience, derived entirely from consultation, is decidedly in favour of a draught, consisting of half an ounce of the oleum terebinthinæ, combined with the same quantity of oleum ricini; or an enema, containing the same medicines. The combination, also, of a purgative with assafoetida, or any other antispasmodic, and an injection, consisting of infusion of valerian, or containing assafoetida, with a due proportion of any aperient medicine (see F. 130, 135, 138.), will seldom fail of giving relief,

by removing flatus, and promoting the restoration of the uterus to its natural state. In the more urgent cases, anodynes may be conjoined to the foregoing means; for, when thus associated, they will not act in preventing the contractions of the uterus. (For HYSTERALGIA, and the various diseases of the uterus in the puerperal and unimpregnated states, see UTERUS.)

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AGE.—SYN.—*Ætas*, Lat. *Das Alter*, Ger. *Age*, Fr. *Êta*, Ital.

CLASSIF.—PATHOLOGY and THERAPEUTICS.

1. In the succinct view I purpose to take of the pathological and therapeutical indications which this subject will naturally suggest to the mind of the practical physician, I purpose, *first*, to sketch the successive epochs of life, and thus consider the word in its *generic* acceptation. When I arrive at those periods of existence to which the word *age* is specifically applicable, the changes which take place in the human frame, in respect both of organisation and function, with the advanced progress of years, — with age in its *specific* acceptation, will be fully stated, as furnishing important data for practical indications in the treatment of diseases of this epoch.

2. I. OF AGE IN ITS GENERIC ACCEPTATION, — or *different Epochs of Life*. — Before I proceed to consider the subject in its enlarged point of view, I may briefly advert to the periods into which the usual natural duration of human existence may be divided. Without occupying my limits with the divisions adopted by ancient and modern writers, I shall adopt that arrangement of the different epochs of life which has been suggested to my own mind, from observing the varying manifestations of life and function, and the modifications of diseased action with advancing age. The division which I have thus adopted may require more to be said in support and illustration of it, particularly in respect of its physiological relations, than I am willing to advance on a subject which may be considered as nearly verging on the speculative. Leaving, therefore, out of sight many of the physiological and psychological views, which would arise out of an extended investigation of the subject, I shall merely briefly advert to topics of practical importance; — those which concern the medical jurist fall not within the scope of this work. (For epoch of *fœtal life*, see FÆTUS.)

3. Before proceeding to consider the different periods of age individually, it may be useful to exhibit a view of the arrangement I intend to follow: —

i. PERIOD, or *that of Infancy*.

1st Epoch, to the commencement of the first dentition.

2d Epoch, from the commencement, to the completion, of the first dentition.

ii. PERIOD, or *that of Childhood*.

Extending from the completion of the first to the completion of the second dentition.

iii. PERIOD, or *Boyhood — Girlhood*.

From the seventh or eighth year to the commencement of puberty.

v. PERIOD, or *Adolescence*.

Commencing with the first appearance of puberty, and extending to adult age.

vi. PERIOD, *Adult Age*.

1st Epoch, or early adult age, or confirmed virility.

2d Epoch, or mature age.

vii. PERIOD, *Declining Age*.

1st Epoch, declining age.

2d Epoch, advanced age.

viii. PERIOD, *Old Age*.

1st Epoch, ripe old age.

2d Epoch, decrepitude—second infancy.

4. i. PERIOD, or that of INFANCY, (*Infantia*, from the privation of speech,) commences with birth, and extends to about the end of the second year, when the first dentition is completed. It may be divided into two epochs; the *first* beginning at birth, and extending to the sixth or seventh month, when dentition is fully commenced; the *second* proceeding from this age to the end of the period, the completion of the first dentition, when the relations of the young being with the external world are fully established by the developement of the sensorial and locomotive organs.

5. A. During the *first* epoch, or that preceding the commencement of dentition, all the structures are merely in the course of developement; particularly the osseous system, the cerebro-spinal nervous system, and the organs of locomotion. The functions are only acquiring activity, and several of them have not yet appeared. The vital phenomena gain strength, whilst certain of those functions, by which the young being is to hold converse with the objects around him, either begin to dawn, or have not yet merged into existence. The manifestations of life are chiefly vegetative, and the movements automatic or sympathetic. The attitudes are generally without variety, and the changes of the countenance express merely pleasure and pain to the spectator; but, to the medical observer, they convey important information, and often all that he can obtain respecting the maladies incidental to this period of life. At this epoch, the position of the limbs, the character of their motions; the cry, and its numerous varieties; and especially the changes of the countenance; the state of the eyes and eyelids; the openness, contraction, &c., of the eyebrows; the appearance of the lips and nostrils, of the mouth, gums, and tongue;—all furnish means of ascertaining the nature and progress of disease.

6. a. At this age the organs of digestion are unsuited to any other food than that derived from the breast of the mother; and so little capable are they to assimilate any other, even of the blandest and most digestible kind, or the milk of other animals, that very few, not more than one in six or seven, ever arrive at the more advanced periods of life who are deprived of the kind of nourishment nature intended for this epoch. At this age the system is extremely susceptible of external impressions acting upon the lungs, surface of the body, and digestive organs; and particularly to the influence of cold. Recently removed from a constant and unvaried warmth, and having heretofore existed with all the mucous surfaces shut from the action of foreign agents, the young infant imperatively requires to be pre-

served, particularly during the first months of this epoch, from the influence of a low range of temperature, and from its sudden changes. The disposition to increased action in all the mucous membranes, and the great susceptibility of the respiratory nerves, require the surface of the body, and particularly the organs of respiration, to be guarded from atmospheric vicissitudes; the chief source of the diseases which are so prevalent and fatal at this age. A similar susceptibility of the digestive mucous surface also exists, and is but too frequently evinced by the slightest change in the milk of the mother, or addition of articles of food unsuited to the state of the digestive organs. Much of the mischief, however, which improper ingesta are calculated to produce, is guarded against by the copious secretion of mucus, with which the internal surface of the stomach and bowels is covered, particularly in very early life.

7. The susceptibility of the mucous tissues to stimuli and irritants, and their proneness to inflammatory action at this age, extend also to the cutaneous surface, as shown by the frequency of acute exanthematous diseases, and of chronic eruptions. The intimate sympathy existing between both these structures is very strikingly evinced, by the frequent association of inflammatory excitement of the mucous surfaces, particularly of the digestive canal, with a similar affection of the skin. The co-existence and close connection of inflammatory irritation of the digestive mucous surface, and an analogous state of disease of the brain and its membranes, or the supervention of the latter on the former, are also often observed. During the first months of existence, vascular action in the brain is prominently developed, and engaged in perfecting the organisation of this organ: and partly owing to this circumstance, as well as to the quantity of blood sent to it, compared with the rest of the body, and to the various causes tending at this age to derange its circulation, is readily kindled into an inflammatory state of its substance or membranes, giving rise to active congestions, effusions of fluid in the cavities and between the membranes, and to various other organic changes particularised in their appropriate articles.

8. b. With the susceptibility to be impressed by the causes of disease, evinced chiefly in the nervous centres and mucous surfaces, and producing their effects, not only on them but also on the serous cavities, there is intimately connected a marked disposition to be affected by medicines, which exert their influence in an especial manner upon the nervous system. Of these the most remarkable are narcotics and irritating stimulants. The susceptibility to the influence of the former, particularly the preparations of opium, and their effects, primarily in increasing vascular action in the brain, and secondarily in favouring congestion in the same organ, according to the dose, have appeared to me so important, that, during an extensive public practice amongst this class of subjects, I have scarcely ever ventured, during this epoch, on the exhibition of these medicines, excepting under peculiar circumstances, which will receive a more particular notice in other places. A similar caution is also necessary in the use of stimulating and irritating substances. The aperient medicines which are so often re-

quired at this age should be chiefly of a mild and unirritating quality; and, whilst cold and moisture must be avoided, too warm clothing, particularly of the head, ought to be equally shunned. Exposure to a mild, healthy air, frequent ablutions of the surface with cold water during the latter part of this epoch, —commencing first with warm water, and passing on to the use of tepid, and afterwards of cold water, as the infant increases in strength, —followed by frictions, and careful attention to the state of its evacuations, are means which should not be omitted in the management of this period of life. Although cold bathing is generally beneficial after the first months of infancy have elapsed, care should be taken not to subject the infant to the influence of cold beyond a minute or two, or longer than may be requisite to the perfect ablution of the surface; for, at this epoch especially, the impression of cold continued for any considerable time depresses the vital energies, and prevents the developement of that state of healthy secretion on the surface, which usually follows the momentary or brief action of cold, particularly when followed by dry frictions.

9. *B.* The *second epoch* of this period, extending from the commencement of the first dentition to its completion, embraces also the important period of weaning. The natural changes proceeding in the different structures and functions during the *first epoch* also continue through this. As this period advances, the functions of external relation, particularly speech and voluntary locomotion, commence, the phenomena of perception are more perfect, and the manifestations of mind begin to appear. The instinctive desires and emotions become more and more evident and active, and furnish, with the other functions, important indications of disease, and of the means of removing it. The susceptibility of the nervous system, and of the mucous surfaces, to be impressed by the usual exciting causes of disease, —particularly by cold, moisture, atmospherical constitutions, and vicissitudes, contagious or infectious miasms, and errors of diet and regimen, —is unimpaired.

10. *a.* *Teething*, which terminates the preceding epoch, and ushers in this, is commonly connected with more or less disorder of the system. In infants of a healthy constitution, and in whom the powers of life are energetic, disorder is scarcely perceptible unless from the operation of very efficient causes; but in those who are debilitated, whose conformation has been originally feeble, or imbued with any hereditary taint or morbid diathesis, or who have been weakened by unwholesome food and impure air, this process is often attended with great disturbance in the frame, and, owing to the morbid sensibility and irritability it excites, frequently kindles up most dangerous disease. During the process of *teething*, particularly at its early stages, the itching and irritation of the gums are a constant source of excitement, or focus, whence irritation extends to the salivary apparatus, as proved by the increased flow of viscid saliva. The continued desire evinced by the little patient to allay the itching of the gums, by pressing between them whatever it can lay hold of, and the evident distress expressed by it if this sensation, which is known to be more insupportable than pain, can-

not be allayed, are indications which ought not to be overlooked. If this distressing sensation be not allayed by judicious means, the nervous system becomes inordinately excited, febrile commotion is induced, the functions of digestion are disordered; and we are, consequently, not infrequently called upon to remove inflammation of the membranes or substance of the brain, various convulsive affections, and inflammatory disorder of the digestive mucous surface, owing to the extension of irritation along the alimentary canal, as well as to the acidities formed in the stomach and bowels, from the imperfect digestion of the food. During dentition also, a marked disposition seems to exist in the pancreas to become excited, owing to its close sympathy with the salivary apparatus; and I am persuaded that several states of diarrhoea observed at this epoch originate in, or are perpetuated by, an increased secretion of pancreatic fluid.

11. Owing, moreover, to the excitement and irritation existing in the gums, affections of the respiratory and digestive mucous surfaces are more frequently associated with one another, and with increased vascular action in the nervous centres and their envelopes. It would seem that the irritation existing in the mouth disposes, from its influence on the nervous system, the mucous membranes not only to be invaded by the exciting causes of disease, but also to undergo the morbid action throughout. How frequently has the experienced practitioner observed inflammatory irritation of the digestive and of the respiratory mucous surfaces associated in the same case; and how often has he had cause to suspect the rapid supervention of irritation of the membranes of the brain, or of the brain itself, either with or without effusion, upon inflammation of the digestive mucous surface!

12. *b.* *Weaning*.—During this epoch weaning must take place. This should not be earlier than the eighth or ninth month, or later than the fifteenth; and the infant ought to have, at least, four teeth quite through the gums before it be commenced. The milk of the mother is the infant's only food during the greater part of the preceding epoch, or, at least, until the fourth or fifth month, unless the mother and child be in a weakly state. From this age upwards it requires food in addition to the nourishment afforded by the mother; but this must be given at first in small quantities, and not oftener than twice daily. As this period of weaning approaches, food in larger proportion, and increased frequency, is necessary; and as soon as it shall have got teeth to masticate animal food, this may be given it in small quantity, and at first only twice in the week. Animal diet is seldom required before the completion of the first year, or previous to weaning; afterwards it may be given in gradually increased frequency, as the termination of the epoch approaches.

13. Whilst the infant is liable to most of the maladies which affect it during the first months, it is now also exposed to the invasion of many more; owing to the excitement occasioned by teething, the state of the milk, particularly during the last months of lactation, and the errors in respect of both the quantity and quality of the food. At the same time, however, its vital energies are more developed, and its functions more

perfect; and thus increased resistance is opposed to the extension of disease, and to its disorganising effects. All infectious and exanthematous disorders are very prevalent at this age; and, in addition to the maladies of the mucous surfaces already alluded to, the lymphatic glands, particularly those of the abdomen and thorax, are frequently the seat of disease; and worms often begin to form, particularly after the period of lactation. At this age, also, owing to the changes in the infant's food, as well as to the irritation occasioned by dentition, the disorders which originate in depraved or imperfect digestion and assimilation are especially prevalent, particularly aphthæ, rickets, tubercles, marasmus, and *tabes mesenterica*, remittent fever, *scrofula*, and numerous cutaneous eruptions.

14. c. The *therapeutical* indications at this epoch chiefly relate to the care which is required to preserve the head cool, and ward off the vascular excitement to which it is liable. Anodynes are less injurious at this period than in that preceding it, and are often required, particularly in soothing the irritability of the nervous system arising either from difficult dentition, from the exhaustion occasioned by previous treatment, or by disease, and particularly in the advanced stages of whooping-cough and croup. The state of the gums requires particular attention; and where there is evidence of itching, this sensation requires to be allayed, first, in the way that nature points out, by pressing hard and smooth substances between the gums, as a coral, ivory ring, and what is best, a gold ring, when this may be directed. If the least appearance of local affection, as tumefaction, redness, &c., or even merely constitutional disturbance, manifest themselves, the gums should be freely and deeply scarified. Ape-rients, of a mild and cooling nature, are often required during this epoch; and in it, as well as in the preceding, blisters, even for a few hours only, particularly when the respiratory mucous surface is obstructed and its functions interrupted, or when the energies are exhausted and the vital resistance consequently reduced, must be employed with extreme caution, and give place to the use of those liniments which I shall have occasion to recommend as substitutes for them under such circumstances.

15. ii. PERIOD, or that of CHILDHOOD (*Pueritia*), extends from about the second to the seventh or eighth year, when the second dentition is completed. During this period the developement of the different textures and organs proceeds rapidly, and their functions are more and more perfect. The mental manifestations, particularly those which are intellectual, are developed, and the various moral emotions gain strength. The distinctions which exist between sexes throughout the whole physical and mental constitution at more advanced ages have not yet appeared. All the soft solids of the body evince increasing firmness, vital cohesion, and elasticity, and are protected by a firm covering of adipose matter below the integuments, and in the interstices between the muscles.

16. a. If the constitution be not vitiated by hereditary or acquired taint, defective nourishment, or previous ailment, or if the causes be not of a depressing nature, disease at this period assumes the *sthenic* character. Febrile diseases

are generally acute; and, unless proceeding from sources of infection, usually the result of local inflammatory action, which evinces a marked disposition to terminate in the formative process, or effusion of coagulable lymph, particularly when the serous surfaces are implicated. The susceptibility to infectious diseases, particularly those with exanthematous symptoms, is very great; as well as to inflammations of the different textures and organs — to pneumonia, bronchitis, cerebritis, meningitis, gastritis, enteritis, &c.: besides these, glandular obstructions, chorea, verminous diseases, epilepsy, and the various forms of angina, are very prevalent at this age, particularly in those whose digestive organs have been neglected, and when morbid matters have been allowed to accumulate in the *prima via*.

17. b. The *therapeutical* indications applicable to this age present few peculiarities, besides the necessity of resorting to active depletions, with a cooling regimen and alvine evacuations in the majority of its diseases; and the keeping in recollection the tendency of mucous sordes and secretions to form and accumulate on the digestive mucous surface. Such accumulations furnish a nidus for the generation of worms, and sources of irritation to this surface itself, and to the nerves proceeding from it; and originate many of the affections which appear at this, and a subsequent period of existence. The necessity of enjoying, and the injurious consequences of the privation, of wholesome nourishment and active exercise in a pure atmosphere, and the advantages of sleeping alone in a large well-ventilated apartment, should not be overlooked, in their relation both to the production and to the removal of disorder. The employment of the faculties of the mind during this early stage of their development should be left, until the last year or two of this period, more as a matter of amusement than of exertion; and, even then, greater attention should be paid to the development of the physical powers, — the organisation upon which sound mental manifestations very intimately depend, — than to the precocious and even hurtful excitement of faculties which are merely budding into existence. The emotions of mind, however, particularly those which are connected with temper and disposition, ought first to receive attention; strict control cannot be prematurely applied in this direction. In this and the preceding epochs of life, it is indispensably requisite not to allow the child to sleep with persons in bad health, or who are far advanced in life.

18. iii. PERIOD, or BOYHOOD — GIRLHOOD. — From the seventh or eighth year to the epoch of commencing puberty, is chiefly characterised by the continued growth of all the structures, and the developement of the manifestations of mind. Towards the middle and end of this period, the physical and mental distinctions of sex become more and more apparent. — a. The frame, when free from disease or hereditary taint, evinces a *sthenic* diathesis, a predominance of the sanguine, or sanguineo-nervous temperament, and a liability to nearly the same diseases, particularly those proceeding from infection and inflammation, that prevail during childhood. There is a greater liability to be affected with idiopathic continued fever, with *scrofulous* enlargements and inflam-

mations, particularly of the lymphatic glands; with various nervous affections, as epilepsy, convulsions, chorea, &c.; with cutaneous eruptions; with inflammations of the throat and air-passages; with tubercles, especially in the lungs and alimentary canal; with flexures of the spinal column, and with verminous diseases. The nervous system possesses great susceptibility of impressions, moral and physical; and inflammatory action has a marked disposition to give rise to new formations, unless when appearing in the advanced stages, or as a sequela, of eruptive or infectious fevers, when it generally occasions serous or sero-albuminous effusions.

19. *b.* These diseases of this period generally require antiphlogistic remedies and evacuations, especially purgatives, either alone or in suitable combination, unless proceeding from depressing causes, particularly those of a specific kind; and even there the necessity of resorting to alvine evacuations, by means of laxatives, or purgatives combined with tonics, is imperative. The vital resistance is usually well marked, excepting in those who have been deprived of wholesome nourishment and pure air, or whose constitutions are radically in fault; and in these, whilst tonics and other means of restoration are required, the due evacuations of morbid secretions and accumulations is equally necessary. Care also should be taken during this, as well as in the preceding period, not to allow the young to sleep in the same bed with the old, nor even with those advanced in age or debilitated, nor with too many—not more than three—in the same sleeping apartment, which ought to be large and well aired. Want of attention to this, is one of the chief causes of disease in early life in London, and other large towns. Academies and boarding schools for both sexes are continually furnishing numerous proofs of this too generally overlooked cause of disease, not only at this, but also at a later stage of life. Attention is also necessary to the exercises of both the mind and the body. Active amusements in the open air are now particularly required. As this period advances, the mental powers acquire such a degree of developement as to admit of their further improvement and active exertion,—not only without risk to the organisation with which they are related, but with the certain prospect of advancing them nearer to the perfection to which our natures may attain.

20. During this and the earlier terms of life frequent changes of locality and of air, particularly from one healthy and open situation to another, and especially to one which is more salubrious, where this can be attained, are extremely beneficial, both in promoting the developement of the frame and in removing diseases, particularly those of a chronic kind, or which affect the digestive and assimilating organs. In many of these diseases more advantage has been derived from change of air than from the use of medicine. But, during advanced convalescence from these and febrile diseases, the benefit obtained from change of locality is most remarkable.

21. *iv.* PERIOD, or ADOLESCENCE, commences with the first appearance of puberty, and extends to the twentieth year of females, and the twenty-fourth of males. Puberty appears at various

ages, according to the climate, the circumstances connected with education, and the constitution of the individual. The usual period in this country, is from the twelfth to the fourteenth year for females; and from the fourteenth to the sixteenth for males. In the northern parts of the island, it is often a year or two later in both sexes. It is often observed earlier in boarding-schools, both in respect of males and females. In the latter (in London or its vicinity), I have not infrequently met with instances of menstruation at ten and eleven years; especially in sanguine and plethoric constitutions; and where the apartments, particularly those for sleeping, have been crowded and close.

22. *a.* This is one of the most important epochs of human existence: for during it the natural developement of the sexual organs imparts a healthy and tonic excitement throughout the economy; bringing to their state of full perfection all the organs of the body and all the manifestations of mind, excepting those that are derived from experience. The organs of respiration and voice have acquired their full growth and tone, the muscles their due proportion, and the cerebro-spinal nervous system its beautiful organisation; placing man, by the exercise of its admirable functions, at the head of all animated creation,—the dread of all other animals, the wonder of himself. It is chiefly during this period of life that the mind becomes stored with ideas, derived both from the learning of the ancients, the science of the moderns, and the arts and accomplishments of highly civilised life; and is more particularly and more ardently engaged in decomposing the information thus acquired, and recombining it in new and useful and attractive forms.

23. As the functions and destinies of this period are important, so they require the supervision of the experienced and the good. For, with this developement and activity of both the physical and mental powers, the instinctive feelings and emotions of our nature have also reached the utmost limits of their activity; and many of them, particularly those which are related to the perfect condition of the reproductive organs, acquire an ascendancy, that both the dictates of reason and moral restraint are required to control. Hence the propriety, both at this and the preceding period of life, of improving the moral affections of the mind; of inculcating sound principles of action and conduct, founded on moral and religious obligations; and of placing them in such relations to the feelings, the intellectual manifestations, and, moreover, to the accomplishments, the elegancies, and the endearments of life, as to render them attractive to a state of mind and constitution which is more easily allured by example than taught by precept.

24. The evil practices which both sexes are liable to acquire at this period of life, and to which they more commonly become addicted, when they associate in numbers at seminaries and academies, demand the strictest prevention. They have been too generally overlooked, both morally and medically, from the circumstance of their consequences having been imperfectly appreciated. There is no practitioner of observation and experience,—none even of limited knowledge,—who is altogether unacquainted

with the physical exhaustion, the mental torpor, and all but annihilation of existence, which is the ultimate result of indulging them. From this source frequently spring, impotency hereafter; the extinction of families and hereditary honours—honours which such persons are incapable of achieving; the infliction, during after-life, of many of the diseases which proceed from debility, and the exhaustion of the nourishment and vital energy of the various structures and organs; numerous nervous and convulsive maladies, as hysteria, epilepsy, neuralgia, chorea, melancholia, mania, idiotcy, &c.; the dangerous or fatal visitation of fevers, diseases of the heart, disorders of the digestive organs, premature baldness and old age, the formation of tubercles, and the production of pulmonary consumption; and, lastly, the transmission of weak and decrepit bodies and minds to the offspring, of scrofula, rickets, verminous complaints, marasmus, hydrocephalus, convulsions, tubercles, chorea, &c.: the curse is visited on the children to the third and fourth generation, until the perpetuated punishment extinguishes the very name of the aggressor.

25. *b.* The *pathological* conditions of this age are especially characterised by exalted action. At the approach and commencement of puberty, the glandular system is extremely prone to congestive inflammations, particularly the lymphatic glands of the neck and arm-pits. Tubercles are rapidly developed in the lungs; and these organs are much disposed to acute and chronic inflammations of both their substance and mucous surfaces. Pulmonary hæmorrhages usurp the place of the epistaxis of earlier epochs; and, in females, dysmenorrhœa, protracted or retained menstruation, chlorosis, hysteria, and occasionally menorrhagia or leucorrhœa, occur. The sanguineous diathesis and plethoric habit, in those of a sound constitution, and the sanguine, irritable, and nervous temperaments, or the one associated with the other, most commonly prevail at this period of life.

26. The *progress* of disease is generally rapid, and its character acute. Inflammations are more prone to give rise to the formative processes; and febrile affections, when they terminate by crises, evince a preference to hæmorrhages and sweats. Idiopathic fevers, inflammations of the respiratory organs, and of the brain or its membranes, are the most common diseases of this age.

27. *c.* The *therapeutical* indications require but little remark; for the system has now nearly, or altogether, reached its full growth; and the general inferences which guide the practitioner in the employment of remedial means have now reference, especially, to states of habit, constitutional powers, temperament, and diathesis,—physical manifestations, which are now, in a great measure, developed, but which acquire their most predominant characters in adult age. As the maladies of this period are generally inflammatory, and evince a strong tendency to the formative process, and as the powers of life are now most energetic, vascular depletions, with the antiphlogistic regimen, are generally required, and are well borne; excepting in those whose constitutions have been originally in fault, or who have greatly injured it by the injurious practice of masturbation, from which so many suffer, both at this and subsequent epochs of life.

28. *v.* *PERIOD.*—ADULT AGE may be divided into the epochs, 1st, of *early adult age*; and, 2d, of *mature age*, or *confirmed virility*. Of each of these I shall take a brief notice.

A. Early adult age may be dated from twenty to thirty in the female, and from twenty-four to thirty-five in the male. During this epoch, if the constitutional powers have not been injured previously, the whole frame and its individual organs continue to acquire strength; and, although the body has ceased to grow in height, it increases in bulk, particularly the muscles of voluntary motion and the parietes of the large cavities. It is also more capable of enduring continued exertion and privations; its vital endurance and resistance being greater than during the period of adolescence. The features and expression of the face; the character, disposition, temperament, and diathesis, are more unfolded, and towards the termination of this period fully display their manifestations.

29. *B. Mature age*, or confirmed virility, may be considered as being from thirty to forty, or forty-five, in the female, and from thirty-four to forty-eight in the male. During this time of life, the features of the countenance fully assume those modifications of character arising from the influence of the passions and emotions of the mind; and the appetites, habits, and occupations of life imprint upon the frame generally certain appearances, arising from their continued influence on the constitution. The muscular organs, particularly the muscles of the extremities, are prominently marked; the chest fully developed; the body spare and active; the adipose structure extremely scanty, and the abdomen small, in those habitually devoted to laborious employments, not of a sedentary nature, and to active exercise, either on foot or horseback. The sedentary, those addicted to the indulgence of the appetites, and particularly those given to the gratifications of the table, have large abdomens, small extremities, and large depositions of adipose matter beneath the integuments, between the muscles, in the omentum and surrounding the viscera, with a weak and defective development of the muscular parts. The studious present the chief marks of their occupations on the features of the countenance and character of the head; the appearance of the rest of the frame varying with the habits and indulgences with which study or the prosecution of science may be conjoined. At this period of life also the feelings, the anxieties, the disappointments, the losses, and the various moral emotions of life, begin to manifest those effects upon the frame, which become still more fully expressed during the following epoch.

30. This and the preceding period of adult age are, upon the whole, the most exempt of all others from disease; but about the age of forty, and still more so as the age of fifty is approached, the sanguineous circulation becomes more and more languid, particularly in the veins: hence the frequency of venous congestions and visceral obstructions, with the various diseases depending thereupon, particularly hæmorrhoids; bilious derangements; bilious and gastric fevers; inflammations; affections of the heart; apoplexy and paralysis; derangements of the stomach and liver; hæmatemesis; affections of the joints, as gout and

rheumatism; diseases of the urinary organs; hysteria and uterine disorders; hypochondriasis, and affections of the mind. At this period, therapeutical means require to be strictly regulated according to the sex, constitution, temperament, habits, and occupations of the affected.

31. II. AGE, IN ITS SPECIFIC ACCEPTATION, may be divided into TWO PERIODS, and these into four epochs: viz. 1st, *Declining age*; 2d, *Advanced age*; 3d, *Old age*; 4th, *Decrepitude*, or second infancy. Before I proceed to consider these individually, I will take a view of the changes which supervene with age in the structures and functions of the body.

AGE, in the specific acceptation of the word, may be considered as commencing when the vital energies of the different organs begin to decline, — when the maturity of life glides into decay. The period at which this change supervenes varies very much in different persons, according to their constitutions, employments, and habits during the earlier epochs of existence. In many it is so gradual as to be imperceptible; in others it is more obvious; and in some it is induced rapidly and remarkably, by mental anxieties and bodily disease. The usual period of its advent, in both sexes, and the different epochs in which age may be divided, will be stated in the sequel.

32. As age steals on, all the functions are performed more languidly than in earlier life. The energies of the ganglial system decline, as evinced by the digestive, circulating, and secreting functions, which it actuates. The sensibility of the cerebro-spinal system, and of its dependent organs; the acuteness of our intellectual powers, our moral emotions and affections, and the activity and strength of the locomotive organs, — all experience diminution, great in proportion to the advances of age.

In noticing the pathological and therapeutical relations of age, those changes of structure and of function which supervene with it will first receive attention; next, the different terms into which it may be divided, with those modifications which diseased actions generally assume in each term respectively, and those indications which should guide our practice in the diseases to which each is most obnoxious, will be briefly considered.

33. A. The modifications of structure produced by age are occasionally slight; but most commonly they are very remarkable, particularly in certain organs. In some parts they are scarcely perceptible, in others more obvious, consisting chiefly of increase of density; and in many they amount to actual change of texture.

The integuments, particularly those of the face, and the hair, are amongst the earliest parts to exhibit the advance of age; and they most obviously indicate the different stages of its progress. The integuments of the face seem more developed than in early or mature age. They are denser and thicker, especially the cutis vera and rete mucosum; which latter assumes also a somewhat darker tint. The skin appears more loosely attached to the parts underneath it, chiefly owing to the diminution of the subjacent fat, and shrinking of the other soft solids. Hence it appears, particularly in the face, neck, and hands, flaccid and wrinkled.

1. 4. The hairs of the head are, perhaps, the first

to evince the commencement of age; and they present the most common indications of the progress of decay, either by a more or less complete change of colour, or a partial and general loss of them. The change of colour at first consists of a few white or grey hairs, scattered amongst those of a natural hue; but these gradually become more numerous, particularly on the temples, until the whole hair is altogether grey, and ultimately white and transparent. As this change proceeds, the hair also falls out, especially on the crown and forehead. There are, however, many circumstances which accelerate these phenomena, independently of age. Thus fevers, severe courses of mercury, masturbation, &c. will occasion the loss of the hair. But when it falls out from disease, the bulbous roots not being obliterated, its reproduction generally follows; whereas, when it is lost from old age or from masturbation, it is never reproduced. There are also various causes which occasion a change of its colour, particularly the depressing passions, intense application to study, anxieties of mind, venereal indulgences, &c., and which at the same time accelerate the loss of it. The change of colour, and subsequent loss of hair, seem to arise from deficient nutrition, and consequent atrophy, or destruction of the bulb, together with some change in the skin itself. In some cases it seems to arise from chronic disease of the rete mucosum and cuticle, as stated in the pathology of certain cutaneous affections.

35. The adipose and cellular tissues experience considerable change. The fatty deposit diminishes with the progress of age, and it sometimes becomes more fluid and watery, as well as of a deeper tint. The cellular tissue is somewhat denser, more fragile, and less elastic than in early life. In some situations it assumes a fibrous character, particularly that portion of it which invests the muscular fibres. The serous membranes are also more dense, more subject to ossific deposits, and their free surface drier than in early life. The mucous surfaces exhibit but little change, excepting as respects their greater paleness, and tendency to certain states of disease. The fibrous structures become more rigid, and in various parts the seat of ossific deposits. They also assume a deeper colour, and firmer and tougher consistence, whilst their physical cohesion is much increased as age advances.

36. The muscles of voluntary motion experience a very marked change, particularly at the advanced epochs of age. They are much diminished in bulk. Their fibres are more rigid, less readily influenced by stimuli, and less contractile than in early life. They are also less under the control of volition, much less energetic in their actions, more flaccid, and endowed with less vital tenacity. Their structure is also somewhat modified. They are paler, sometimes of a light yellow colour, and their fibres less distinct than in youth. The tendons and aponeurotic expansions of muscles, as well as the cellular tissue intervening, are often partially ossified. Portions of muscles, near their tendons, are sometimes converted into a tendinous structure; and the secretions poured into the sheaths of the tendons are remarkably diminished. From all these changes result the vacillating, embarrassed, and weak movements of the aged.

the secretion and retention of this fluid, or after its discharge.

45. Not only are the mechanical conditions of the different parts of the body modified by age, as now stated, but their chemical properties are also similarly affected. The gelatin disappears, or becomes changed to albumen; the fibrin is increased, and assumes a deeper hue, and is less easily affected by maceration or exposure to the air. The phosphate of lime is augmented, and often accumulates to a very hurtful extent, together with the other earthly salts and urea.

46. *B. Of the conditions of function characterising the advance of age.*—*a.* Although the changes, which have been now described as supervening in the different structures with age, may have originated in those imperceptible and slow modifications which the various organic functions experience from peculiarities of constitution, of food and employment, or from acquired habits and indulgences; yet there can be no doubt that, when once induced, they modify still further these functions, and thus draw on other lesions, and ultimately still greater alterations of both function and structure, or even speedily fatal disease. But we are not altogether justified in considering these contingencies as the primary causes of the changes now described. We are rather to view them as more or less remote effects of the failure of the vital endowment of the frame, manifesting itself first in a less perfect performance of the different functions, and subsequently in modifications of structure, and ultimately in very obvious lesions of both function and structure.

47. *b.* It was supposed by Brown and others, that the embryo at its earliest formation is endowed with a certain sum or allotment of vitality, which, in the earlier epochs of life, is engaged in the formation of, and in bringing to perfection, the different structures and organs of the frame; that it is gradually exhausting itself ever after, until it at last expires; and that the greater the excitement of its different manifestations and functions during the subsequent stages of existence, the more rapidly will its termination be reached; that the oil with which the lamp of human, and indeed all animal, existence burns, is filled at its commencement, and is never afterwards supplied; and that the more brilliant the flame, the shorter will be its duration. This captivating hypothesis, however, appears, on an intimate view, irreconcilable with many of the phenomena of health and disease. It cannot readily be conceded that the allotment of vitality betowed upon the germ or germs can exceed that possessed by the parents,—for the hypothesis is, that the sum of vitality is greater the younger the animal; and that it diminishes with the advance of days and years, from the period of its endowing the embryo. But it is obvious, that the greater vital endowment cannot issue from the smaller; that the parents cannot possibly impart to the embryo more than they possess, they still retaining a portion afterwards: more particularly when we consider that the greater endowment is imparted not to one embryo only, but to several, as is the case in the lower animals, and often in the human species also.

48. The phenomena, moreover, of disease furnish us with proofs that this sum of vital endowment is neither thus early and at once bestowed, nor

thus uniformly diminished, according to the waste it experiences, without occasional reinforcement. We frequently perceive all the manifestations of life reduced, at different epochs of existence, nearly to total extinction, particularly in several kinds of fever, when, having received the requisite aid from external stimuli, they have been gradually restored to their former activity. Indeed, the various circumstances in which the body is placed, and the different states it presents at different periods of life, and from numerous causes which affect it, seem rather to favour the idea that the sum of vitality, and its manifestations in the different organs, fluctuate more or less during the allotted period of existence; that a certain emanation of vitality proceeds from the parents, great in proportion to their constitutional powers; but that this endowment is constantly experiencing an accession, first from the mother, and subsequently from the common sources of air and aliment; that this reinforcement is thus constantly supplying the waste arising from the exercise of the various functions, and adding to the bulk of the structures, until manhood is reached; and that at this period the sum of vitality has reached its greatest amount, from which it gradually declines, owing rather to the waste, particularly that occasioned by the exercise of the generative functions, exceeding the supply, than from the continued expenditure of what is at first bestowed and never afterwards reinforced.

49. Having been induced by the foregoing, and other considerations, to relinquish the former for the latter hypothesis, I infer that the gradual diminution of the vital energies that accompanies the progress of age is more or less manifested throughout all the frame; that the functions first evince this decline, and that the organs themselves are at last modified in organisation, from the slightest and almost inappreciable shades to the most marked alterations. The changes of structure, once induced, tend most essentially to heighten and to perpetuate the previously slight disorders of function, until both the one and the other undergo, by reciprocity of influence, most important alterations, terminating at last in death, and the dissolution of the frame.—I now proceed briefly to notice those changes of function, which, frequently related to the alterations of structure described above, mark the existence of Age.

50. *c.* I have, in another place, stated that, of all the different tissues of the frame, the ganglial system is the most intimately related, in every way, to the vital influence which endows the body. And it is precisely those organs which are most immediately connected with this system that first furnish proofs of incipient decline in the languor or imperfections of their functions. Amongst those functions are comprised those of digestion, secretion, circulation, assimilation, the preservation of the animal temperature, and generation. The functions of animal relation are not so soon affected; and at first the change in them is rather secondary, and owing to the pre-existing change of the functions of organic life,—of those functions which are excited or actuated through the medium of the ganglial system.

51. As very intimately dependent upon the state of the ganglial system, the secretions manifest, with the advance of age, the most remarkable

impaired, excepting in as far as respect early-formed associations and affections, which are often recalled with acute and even overwhelming emotion.

58. As age advances sleep is much lessened; and not only is the duration of repose abridged, but also its soundness; the rest of the aged being imperfect, and disturbed by dreams. It is difficult to explain this—indeed no satisfactory explanation of it has yet been offered; but it is generally observed, particularly in very advanced age.

59. Such are the changes induced by age in the various structures and functions of the body, as evidently caused by the gradual decline of the vital energy, from the period of full manhood to its ultimate extinction. I have described them as much divested as possible of the effects of disease. As now noticed, those changes gradually lapse into death,—the lamp of life having burnt out, its oil having been exhausted, after a gradual diminution of the supply, without any single organ evincing that state of disease to which the cessation of life can be ascribed. This is, however, not a common occurrence; for, during the gradual decay that marks the progress of age, some organ or other, owing to the deleterious influence of surrounding agents, or of mental emotions, and the weak resistance of the vital influence, experiences a more or less marked derangement, which increases to actual disease, and either abridges the remaining short period of existence, or renders it less supportable.

I now proceed to notice the different epochs of advanced age, with reference chiefly to the diseases incidental to each, and to the therapeutical considerations which should influence the treatment of them. (See CLIMACTERIC DISEASE.)

60. vi. PERIOD, or DECLINING AGE.—1st Epoch, or declining age, extends from 42 or 45 to 55 in the female, and from 48 to 60 in the male.—a. During this period the appetites, occupations, and habits express themselves still more strongly upon the outward appearance of the frame than in that immediately preceding it; and the feelings, emotions, disappointments, and anxieties of life manifest more fully their effects upon the internal organs, as well as upon the external aspect. Venous congestions, visceral obstructions and engorgements, with all the specific forms of disease already enumerated (§ 30.), are more frequent than during earlier epochs, particularly apoplexy and paralysis, hæmorrhoids, hepatic disorder, dropsies, structural change in the kidneys and bladder, hypochondriasis, hæmatemesis, gout, and chronic affections of the respiratory organs.

61. b. In this period, the second great change to which the constitution of the female is liable generally occurs, terminating that epoch in which her sexual constitution is especially marked; and with this change frequently commence, or are matured, several diseases of the female organs. Morbid changes of the uterus and its appendages, as well as of the breast, are now very frequent; and sometimes they assume a malignant character. Various maladies, to which the female was less exposed than the male, are now oftener met with; and her constitution, with its disposition to disease, approaches more nearly to that of the male than during the time of marked uterine activity.

62. 2d Epoch, or advanced age, may be reckoned to commence about 55, and to extend to 63 or 68 for the female; and to begin about 60, and extend to 65 or 70, in the male. During this epoch the nervous, circulating, and muscular energies begin to languish, with the vital actions of the different internal organs. The functions of the sexual organs gradually disappear. The female no longer conceives; and sexual plethora has ceased to supervene and to relieve itself by a periodical discharge. The ovaria begin now to be gradually diminished in bulk, and to assume a firmer structure; the appetite for procreation slowly disappearing (§ 43.54.).—The male organs also either become less disposed to their proper functions, or nearly altogether lose the faculty of performing them, particularly when the energies of the constitution have been exhausted by previous indulgences carried to an excessive length, or by mental exertions. The teeth decay, and the digestive functions suffer from the imperfect mastication of the food (§ 41.).

63. vii. PERIOD, or OLD AGE.—1st Epoch, or ripe old age, dates from the preceding, and extends to 75 or 80 in both sexes. During this term the sensiferous and sanguiferous systems languish more and more, and all the vital organs experience a rapid decline of activity. The teeth fall out, the gums are partially absorbed, and the digestive functions are greatly impaired. The sexual organs are nearly or altogether deprived of their functions; the digestive and assimilating viscera experience a marked diminution of power; and senile marasmus, or the leanness of old age, advances (§ 53.).

64. a. The diseases of this and the preceding epochs are chiefly weak or imperfect digestion and assimilation; chronic inflammations; general asthenia and cachexia; apoplexies; paralysis; loss of the senses of sight and hearing; senile gangrene; comatose affections; dyspnoea; diseases of the heart and liver; dropsies; organic changes in the urinary and sexual organs of both sexes; passive hæmorrhages, from the stomach, bowels, and urinary organs; mental disorder; and gradual extinction of the vital functions and energies. Febrile and inflammatory diseases have a much more marked disposition to terminate in organic change, owing to the diminution of vital resistance, than during the preceding epochs of life.

65. b. The therapeutical indications of this period are in some respects important, but chiefly with reference to the necessity of supporting the powers of life during the diseases to which it is liable. When inflammatory or febrile disorder is present, and depletions or evacuations are necessary, we should, particularly if we employ them actively, watch their effects, and resort to the use of means calculated to support the frame as soon as indications of exhaustion are manifested. Purgatives at this period should, if frequently repeated, always be combined with warm, tonic, or supporting medicines, or with a restorative regimen; and a strict reference ought to be made to the habits, constitutional powers, and feelings of the patient, in all the remedies we prescribe. Old habits must not be suddenly relinquished or opposed, and the powers of life should be carefully watched; for, if unheedingly reduced, they will, particularly in large cities, often sink most rapidly, without the power of rallying. When we

consider that, in persons advanced to this age, a considerable portion of the arterial system is often in a state of slow organic disease; that the venous system is prone to congestion, is sometimes relaxed and almost varicose, always deficient in vital contractility, and scarcely able to perform its functions; and that both the one and the other cannot thereby so readily accommodate themselves to sudden or copious losses of blood as in early life and when they are perfectly free from disease, we cannot be surprised at the sudden depression occasioned by vascular depletion, or other means which produce a rapid discharge by the excretories of the watery parts of the blood, or a sudden depression of the nervous energy, even although symptoms seemed unequivocally to demand their employment.

66. The last epoch, or that of *Decrepitude*, or *second infancy*, commences at from 75 to 80, and terminates the life of those whose span of existence is thus far prolonged. A greater number of females than of males reach this extreme age, especially the utmost extreme. During this period, all the physical and mental powers rapidly decline. The body emaciates, the muscles waste, and the adipose structure is absorbed; the integuments becoming lax, wrinkled, dry, and disposed to retain accumulations of sordes. The knees totter and bend under the weight of the body; the trunk stoops, and is incapable of any considerable motion, excepting forwards; and the features are wan, devoid of colour, wrinkled, and emaciated, and apparently consisting chiefly of integumental covering (§ 33.).

67. a. Congestions, enlargements, obstructions, and even atrophy of the internal viscera; effusions of fluid into the shut cavities; irregularity of the heart's action from loss of its vital activity, or structural change of its valves, its arteries, or muscular texture, or from disproportion between the capacities of its compartments; lesions of the vascular system generally, in which either those of the arteries or of the veins predominate. Passive hæmorrhages from the mucous surfaces, particularly those of the alimentary canal and urinary apparatus; general asthenia, or cachexia; and slow extinction of the vital and natural functions of the frame,—the ganglial, the cerebro-spinal, and the circulating systems; and the digestive, the respiratory, the secreting, and excreting organs, evincing individually, or either of them conjointly with others, more or less disease,—are the principal causes of death: and thus man, whose mental and physical constitution and organisation were objects of profound study and admiration to himself, passes away; the vital essence, that actuated the wisely devised frame with which it was so surprisingly associated, returning to the Divine source whence it emanated; and the gross materials, which it combined and preserved in wonderful states of association, assuming novel modes of existence, and serving to form new beings much lower in the scale of organised creation.

68. b. The rapidity with which acute disease generally runs its course at this period, and the celerity with which organic change will frequently supervene and extinguish the dimly burning taper of life, require great decision and circumspection on the part of the physician. The resistance which the energies of life usually oppose, both to the extension of disease to other viscera from that

first attacked, and to its disorganising effects in its primary seat, is now so excessively weakened, that remedies, directed with a due regard to the previous habits of the patient, in support of those energies, are particularly necessary. On the choice of cordial remedies, and on their appropriate application to the circumstances of individual cases, will depend their success, and the reputation of the physician. At this period, depletions and all evacuations, excepting such as are requisite to carry off accumulations of morbid matters from the *primæ viæ*, and which impart, along with their evacuating operation, a restorative and cordial influence, must be abstained from; and care should be taken that fainting, or even nervous depression, may not supervene from their action. Warmth, at this and the preceding terms of advanced age, is indispensably required, both in the clothing and apartments; but it should be equable, and not too high. The lungs of very aged persons should be guarded from the ingress of very cold air, as the impression of cold in this organ paralyses its functions, arrests those changes which the blood undergoes during respiration, and induces apoplectic or comatose seizures, and idiopathic syncope or inaction of the heart. For these reasons, also, atmospherical vicissitudes should be assiduously avoided, as far as the means of doing so are placed within our reach. There is scarcely any measure more influential in supporting the sinking vital energies of age than the communication of animal warmth, particularly from the young of our own species. This was well known to the ancients, and is one of the oldest restorative means of treatment practised, having been adopted by DAVID. The aged ought also to avoid the use of very cold fluids, as being apt to depress the energy of the stomach below the power of healthy re-action. Medicines, also, particularly purgatives of a cold nature, as the neutral salts, if exhibited at all, require to be combined with warm aromatics or stimulants, in order to counteract their depressing influence upon the alimentary canal, and on the nerves of organic life.

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AGRYPNIA. See SLEEPLESSNESS.

AGUE. See FEVER — INTERMITTENT FEVERS.

AIR. See DISEASE, its Causation, Removal, &c.

ALOPECIA. See HAIR, the Loss of.

AMAUROSIS, from *ἀμαυρός*, obscure. SYN.

Gutta Serena, *Suffusio Nigra*, Celsus, Lucretius, Pliny. *Obscuritas*, *Hebetudo*, Paulus Aegin. *Paropsis Amaurosis*, Good. *Cataracta Nigra*, Auct. Germ. *quibusd.* *L'Amaurose*, Fr. *Die Schwarze Staar*, Germ. *Gotta Serena*, Ital. *Stekelindheit*, Hol. *Suffusion*, *Drop Serene*, Milton. *Dimness of Sight*, *Blindness*.

CLASSIF. 4. Class, Local Diseases; 1. Order, Impaired Sensations (Cullen). 4. Class, Diseases of the Nervous Function; 2. Order, Affecting the Sensations (Good). *Functional Amaurosis*, I. CLASS, IV. ORDER. *Organic Amaurosis*, IV. CLASS, III. ORDER (Author, see the Preface).

1. DEFIN. *Partial or total blindness, from affection of the retina, or of the nerves, or of that part of the brain related to the organ of sight, whether arising primarily from functional disorder, congestion, inflammation, or any other change of these parts; or occurring from sympathy with other organs.* Or, in other words, *Partial or total loss of sight, from other causes than those which obstruct the passage of the rays of light to the bottom of the eye.*

2. Amaurosis is met with at all ages; but most frequently in the more advanced terms of life. It is sometimes congenital; and in these cases it is often difficult to ascertain the nature and seat of the affection. When it occurs at advanced periods of life, an attentive enquiry into the history of the disease, of the previous habits and ailments of the patient, and of the various resulting and related morbid phenomena, will generally throw light upon its pathology.

3. I. SEAT OF AMAUROSIS. — 1st, *In the retina.* — Viewing the delicate structure of the retina; its relation to the optic nerve, of which it is an expansion of great tenuity; its connection with the choroid and hyaloid membrane, and its nervous and vascular communications; and considering the various morbid states it is liable to undergo, in consequence of its relations with these and other parts; a partial, and even total, abolition of its functions is to be looked for on some occasions. It is, like all other parts of the frame, liable to congestion and inflammation, with their usual results; and, like other nervous parts, its functions are subject to a partial or complete extinction without itself evincing any change of structure, its sensibility alone being impaired or abolished; owing either to some unappreciable change, or to some one or more of those alterations in its adjoining or related parts about to be noticed.

4. 2d, *In the optic nerves.* — These nerves may be more or less changed in some part of their course, from the anterior pair of the corpora quadrigemina, along the thalami, the tubera cinerea, and their partial decussation, until they terminate in the formation of the retinae. In appreciating, however, lesions in the course of the optic nerves, the results of experiments on them should be taken into consideration: — if an optic nerve be divided previous to this decussation, sight is altogether lost on the opposite side; but if the division be made between the decussation and the eye, vision is lost on the same side.

5. 3d, *In the ganglial nerves.* There is every reason to suppose that the retina is in intimate communication with other nerves, and that it mutually influences and is influenced by them. Branches of the great sympathetic may be traced upwards, from the first cervical ganglion, to the ganglion lodged in the cavernous sinus; whence branches proceed and communicate with the third, the first division of the fifth, and sixth pairs of nerves. Branches also pass from the cavernous ganglion directly to the lenticular ganglion. As the internal carotid artery passes into the cranium, it is surrounded by the sympathetic nerves, which accompany all its ramifications. The ophthalmic artery is invested with these nerves; its branches to the choroid, iris, and retina being similarly provided. Branches of nerves, moreover, proceed from the lenticular ganglion, as M. RIBES, (*Mém. de la Soc. Méd. d'Emulation*, t. vii. p. 99.), and others have demonstrated, to the iris, giving more minute branches in their course to the retina. This connection being established, morbid states of these nerves and ganglia, or changes of structure in their vicinity affecting their functions, must necessarily impair the sense of sight.

6. 4th, *Other nerves*, as the fifth and third pair are, in some cases, also the seat of amaurosis. It has been shown by MAGENDIE and DESMOULINS that the integrity of the fifth pair is necessary to the perfect function of the retina; and Mr. MAYO has furnished evidence that the third pair is requisite to the motions of the pupil. If the great sympathetic be divided in the upper part of the neck, the pupil becomes contracted and immovable, and the eye wastes.

7. 5th, *Parts of the encephalon* connected with the optic nerves in their course are occasionally the seat of amaurosis, as pathological research and experiment have shown. MM. MAGENDIE and SERRES have proved that, when these parts are wounded, the sight of the opposite eye becomes either weak or extinct.

8. 6th, The *pineal* and *pituitary* glands are frequently the only parts in which any alteration can be detected in the examination of amaurotic subjects. The connection of these glands with the ganglial system is stated at another place. Besides these, other parts of the brain, when the seat of organic disease, are not infrequently the principal source of amaurosis, as shown hereafter.

9. II. CAUSES. — 1st, The *predisposing causes* of amaurosis are very diversified. Amongst these, the influence of hereditary disposition is well established. BERR traced it in several families; in one of them through three successive generations, and particularly in the females of that family who had not borne children, it having appeared in them at the cessation of the menses. BERR also states, that dark eyes are much more liable to it than the light; the proportion being upwards of twenty to one.

10. Whatever tends to favour sanguineous congestion of, or serous effusion in, the encephalon, particularly insolation; forced exertions of the mind or body; excesses of passion; the pregnant and puerperal states; occupations requiring frequent stooping; errors of diet, and neglected ailments affecting the stomach and liver; the abuse of wine or spirituous liquors; suppressed discharges, particularly those from the nose and ears; interruption or entire cessation, of the

menses; the gouty, rheumatic, and strumous diathesis; the retrocession or suppression of eruptive diseases; and habitual constipation; — whatever exhausts the vital energy of the brain, and nerves supplying the organ, as chronic diarrhoea, typhoid fevers, the excessive use of snuff, long-continued grief, prolonged suckling, neglected fluor albus, excessive venery, and masturbation; — and lastly, whatever exhausts slowly the sensibility of the organs of sight themselves; as the incautious use of the eyes in a glaring light or on minute objects, and the existence of strumous ophthalmia in childhood, generally *pre-dispose* to amaurosis.

11. 2d, The *exciting causes* are very numerous; indeed, any of the causes enumerated as merely predisposing to the affection may excite it, when acting long or intensely, although the successive or combined action of various causes are generally required. Amongst the most common exciting causes, are over-exertion of the sight; exposure to very bright light; its occupation on minute objects, or employment in candle or lamp light, and during the hours usually devoted to sleep. The sensibility of the retina may be destroyed, even by a single exposure to these causes. Lightning is another cause, which seems to act by extinguishing the sensibility of this very delicate part. In general, however, it is the long-continued over-excitement of the organs of sight that occasions the gradual abolition of their functions. Injuries on the eye, and in its vicinity, are also frequent causes of the disease.

12. Poisonous substances occasionally produce an attack of amaurosis; sometimes suddenly, at other times slowly. Belladonna, stramonium, solanum dulcamara, &c., fish-poison, various fungi, and animal poisons, occasionally have the former effect; but it is most frequently only of temporary duration; whilst other narcotics taken habitually, as opium and tobacco, produce the latter effect, and in a more permanent manner. The poison of lead, blows on the head, child-labour, and puerperal convulsion, frequent attacks of epileptic or other convulsions, cerebral apoplexies and paralysis, injuries of the branches of the fifth pair of nerves (three cases of which have come before me), and even irritation of these nerves, will produce this affection; it has also been observed to supervene to gastric and intestinal irritation, particularly when occasioned by worms; to hypochondriasis, and accumulations of bile in the liver, &c.; to frights, and to the irritation proceeding from carious teeth. The sudden suppression of epistaxis, of hæmorrhoids of the lochia, of the milk in nurses, of the menses, or of the perspiration; the repulsion of eruptions on the head and behind the ears, and the drying up of old ulcers, have, severally, occasioned the disease. But most frequently it is the result of two or more of these causes, acting under circumstances of predisposition. Females with dark eyes are extremely liable to the disease, upon the cessation of the menses; and, like deafness, it is apt to appear after severe attacks of typhoid and scarlet fevers. Amongst the more rare exciting causes of this affection, are the gouty and rheumatic diathesis, or misplaced and retrocedent gout and rheumatism; the constitutional effects of syphilis, and hurtful influence of mercurial courses; — all which have been assigned

as causes of the disease by some authors, and denied by others; but, undoubtedly, producing it on some occasions, although not so frequently as the former believe.

13. 3d, The *proximate* or *efficient causes* of this affection are various. It has been disputed whether or not it can arise from altered function only, and without change of structure. Mr. TRAVERS believes that it does, but Mr. MACKENZIE denies it can depend upon morbid function merely; and other writers take opposite sides of the question. There can, however, be no doubt, if we attentively consider the disease in relation to the exciting causes and the effects which are observed to result from them, that, although most commonly the consequence of some appreciable change in some one or more of those parts instanced as its seat (§ 3—6.), it is occasionally unattended with such change, — at least to such an extent as our observation of the effects proceeding from similar alterations would lead us to expect. It should not be overlooked that the operation of many of the causes which have been adduced above is entirely vital — upon the functions of life, as manifested in the organ, or in remote parts of the frame; — that their effects are sometimes almost instant, and before organic change could have been produced; and that the disappearance of their effects has been sometimes as sudden, and often before the restoration of morbid structure, providing that it existed, could have been brought about. I believe, after a careful perusal of the works which have been furnished by surgeons on this disease, that a too marked disposition has been evinced to consider it as a result of organic change in the organ and the nerves, and vessels connected with it, and without relation to constitutional and vital causes.

14. When describing the *seat* of amaurosis, the influence of organic changes has been briefly noticed; and a fuller reference to them will be made in the sequel. Amongst the numerous lesions of structure that occur in the brain and its membranes, there are many that affect the nerves of sight, more particularly the optic nerves, or which implicate them organically in some part of their course in a very remarkable manner. Alterations in the bones of the cranium, as well in the membranes, obstructing the functions either of these nerves or of the other nerves subservient to the perfect exercise of this important sense, are also not uncommon.

15. The *EFFICIENT CAUSES* of this affection, therefore, are, 1st, *vital or functional*, depending upon imperfect or abolished sensibility of the retina, or of the optic and other nerves subservient to vision, owing either to causes which, from their direct and local action, depress or exhaust this property, or to those which, from their primary influence upon the frame, have an indirect depressing effect, which is not limited to this organ, although manifested in it in a more marked degree, owing to various concurrent circumstances. This constitutes the *functional form* of amaurosis admitted by BEER, WARDROP, TRAVERS, SANSON, and others, and which BEER divides into two subordinate kinds: *first*, that which proceeds from direct depression of the vital sensibility of the eye; and, *second*, that which is owing to inordinate excitement, and consequent exhaustion of this property.

16. 2d, *A congestive or inflammatory state of the vessels of the retina, or parts immediately adjoining, or the usual effects of these states.*—PORTAL, PLOUCQUET, PROCHASKA, ROUSSEAU, SANSON, MAGENDIE, and other pathologists, have observed varicose states of these vessels; unusual injection of the minute arteries of the adjoining coats, and of the retina itself; a complete retinitis; exudations of lymph under the choroid, near the ciliary circle; inflammation of the external surface of the sclerotic; vascular injection, and firm adhesion of the retina to the choroid; partial detachment of the retina from this coat; and thickening, morbid density, and change of colour of the retina. Ossification; fibrous degeneration, with partial thickening; wasting, and malignant disease of the retina, and even the developement of transparent vesicles in it, have all been noticed by HALLER, MORGAGNI, HEISTER, SANSON, and other authors.

17. 3d, *Lesions affecting the optic nerves.*—These consist chiefly of tumours of various kinds—osseous, fibrous, encysted, steatomatous, puriform, aneurismal, &c.—formed in their vicinity, either in the brain, the membranes, or in the bones of the cranium, and involving, or compressing them, in any part of their course. They are likewise, occasionally, the seat of some one, or even more, of those organic changes of their proper structure and sheaths, to which nervous parts are liable. Their vessels may be varicose; their fibres may be infiltrated with serum; they may be injured by external violence, and they may be wasted; which last is very frequently observed. Adventitious deposits, as osseous and earthy matter, malignant formations, cysts and hydatids, may even form in their sheaths, although more rarely than the foregoing lesions. The writings of pathologists abound with instances of these changes. When only one eye has been amaurotic, the optic nerve of that side has been found wasted anterior to its partial decussation; and on the opposite side, posterior to this union. But this is by no means an uniform circumstance, and, when observed, the atrophy is not distinctly continuous. Indeed, the wasting has been detected on the same side, after the union of these nerves, as well as before. But if the opinion of TREVIRANUS and WOLLASTON be correct,—that decussation of these nerves at their union is only partial, and that it takes place chiefly between the parts which are nearest each other,—wasting of one of them may be in one case more remarkable on the same side, and in another case more observable on the opposite side. When the amaurosis is accompanied with wasting of the optic nerve, from causes not primarily consisting of inflammation or its consequences in the retina or adjoining coats, this nervous expansion is also generally wasted, transparent, or changed in colour. When the cause exists in the pineal or pituitary glands, the wasting is often chiefly observable at the union of the optic nerves. In these cases, both eyes are affected. Facts illustrative of this have been recorded by VIREUSSENS, DE HAEN, RULLIER, RAYER, WARD, and SANSON.

18. 4th, *Lesions seated in the encephalon.*—The scope of this article will not admit of further reference to the numerous changes which occasionally produce amaurosis, from their affecting

the optic nerves in their different connections with various parts of the encephalon. All the alterations which are described in the articles on *morbid structures of the brain and its membranes*, will produce the disease, when they impede the functions of the optic nerves, although the structure of these nerves may be uninjured. The most frequent and remarkable of these are, organic lesions of the pineal and pituitary glands (§ 8.), sanguineous and serous effusions, various kinds of tumours, abscesses, softening of the brain, &c.

19. 5th, *Lesions of nerves subsidiary to the integrity of the organ and of its functions.*—Injuries, compression, and even irritation of the fifth pair of nerves, particularly its ophthalmic branch, of the third and sixth pairs, and of the ganglia or their ramifications, by organic change in the brain, its membranes, bones of the cranium, or parts in the course of their branches, have been shown, in numerous instances, to have been the chief efficient causes of amaurosis.

20. III. SYMPTOMS.—The symptoms of amaurosis are, 1st, those which the *patient himself experiences*; and, 2d, those which the *physician detects* in the eyes, or in the various organic and animal functions. Each of these classes of symptoms are to be enquired into separately, commencing with either of them. Each eye should be carefully and separately examined; and it will be better that the other is excluded from the light, whilst the examination is being made.

21. 1st, The patient complains of impaired vision, which may be of gradual accession, or remarkably sudden, and amounting to almost total deprivation of sight. Hence the disease has been distinguished by the epithets *slow* and *sudden*, *incomplete* and *complete*, or *imperfect* and *perfect*.

22. At the commencement, the failure of vision is sometimes only occasional, for a short time, and after longer or shorter intervals (*amaurosis vaga*). In some cases it assumes the form of *day-blindness*, in others of *night-blindness*: and it not infrequently recurs for a time after great exertion of the eyes, either with minute or bright objects. Transient and sudden attacks of the disease are often the consequence of disorder of the digestive organs, or rather the result of a state of the vital manifestations which occasions equally loss of sight as well as loss of the digestive functions. The failure of sight is often at first only partial—extending only to a part of the field of vision. In some cases, intervening portions of the field are obscured (*visus interruptus*). In other cases, one half of it is hid from view (*hemipopia*). Occasionally objects are only seen in a particular direction (*visus obliquus*); and some patients discern objects in a distorted form—crooked, mutilated, shortened, lengthened, or inverted (*visus deformatus*). BEER states that the flame of a candle will often appear elongated, and as if separated into several portions, to such patients,—a symptom indicating disease within the head.

23. In some instances the failure of sight assumes a *myopic* or a *presbyopic* form: but this is not so frequent as the occurrence of false impressions, in the form either of flashes of light, shining stars, globes of light, and various other lucid spectra (*photopsia*), or of muscæ volitantes. False impressions of colour (*chropsia*) are also frequent attendants on the early stages of amaurosis. Luminous spectra are commonly met with in plethoric

persons, and when the amaurosis depends upon increased vascularity, or inflammation of the retina; motes, black specks, *muscae volitantes*, and thick mists or clouds, when the affection is dependent upon exhaustion of the sensibility and vital energy of the organ, and when it occurs in dyspeptic subjects from exhausting causes. Double vision is also a common symptom, particularly when the cause exists within the head.

24. As the disease advances, the field of vision appears as if obscured by a cloud, or net-work; the latter appearing grey or black in a good light, but occasionally becoming white, silvery, yellowish red, and luminous in the dark. In addition to these, the patient sometimes complains, particularly early in the disease, of some intolerance of light, or of pain in the eyes on being exposed to it. But, in other cases, from the very beginning, diminished sensibility of the retina, and a constant desire for a stronger light — a thirst of light — are present.

25. Pain in the eyes, and commonly also in the head, is one of the most important symptoms of amaurosis. It should, therefore, be carefully investigated. We ought to ascertain its precise seat and extent; its character — whether it be acute, gravative, throbbing, occasional, or permanent. The circumstances which relieve or exasperate it should also be noted; as the horizontal posture, temperature, exercise, diet, the use of stimuli, &c. We should also notice whether it be accompanied with vertigo, tinnitus aurium, watchfulness, or stupor, coma, forgetfulness, inability of exertion, or failure of other mental manifestations; as, from the nature and grouping of these symptoms, we infer the nature of the efficient cause of the disease, particularly as they suggest its existence within the cranium.

26. Unusual dryness of the eyes and nostrils sometimes is observed in amaurosis; and in these cases benefit is often derived from a restoration of the secretions of the lachrymal gland, conjunctiva, and Schneiderian membrane. (MACKENZIE.)

27. The general health, and previous ailments of the patient, require a particular investigation. The constitution and diathesis — whether he be strumous or gouty; whether he has had syphilis, or undergone long courses of mercury; whether he has had typhoid fevers, or inflammations of the brain, or apoplexy, paralysis, epilepsy, or injuries on the head; whether he has been subject to complaints of the digestive organs, or has been, or is, affected with worms: if a female, whether she has been frequently attacked with paroxysms of hysteria, or any of its anomalous forms, or with convulsions in the puerperal state, and particularly whether or no there exist any sign of disorder in the uterine organs — are all particulars most requisite to be known.

28. 2d, The form, colour, vascularity, and mobility of the different parts of the eye, and habit and appearance of the patient, next require investigation. The amaurotic patient walks with a gait of uncertainty, and a staring and unmeaning look. In some cases this want of convergency of the eyes towards an object may amount to slight squinting, occasionally with oscillation, and sometimes with unusual fixity of the eyes. In some instances, the motions of the eyelids, and of the eyes themselves, are more or less impeded, or even palsied, — the *levator palpebræ superioris*, and the orbicu-

laris palpebrarum being often affected. These phenomena are chiefly remarked in cases where the motor oculi, or the facial nerve, is injured.

29. One or both eyes are often unusually prominent. The colour of the sclerotica is frequently somewhat changed — being either yellowish, bluish, or ash-coloured. This coat is often covered with small varicose veins. The consistence, also, of amaurotic eyes is occasionally altered; in some cases the eyeball is firmer to the touch, in others softer, than natural. In rarer instances, it is flattened on one or more of its sides.

30. The pupil is generally sluggish and limited in its motions, or altogether deprived of motion, and dilated. More rarely it is contracted. In many cases it is neither dilated nor contracted. A widely dilated pupil, although generally attendant on pressure on the brain, also occasionally depends on other causes. Early or incomplete amaurosis is rarely attended with dilated pupil; but after all vision is extinct, the pupil is generally more or less expanded and motionless. It should not be overlooked, that where only one eye is amaurotic, the motions of the pupil of the affected organ will often follow those of the sound one, when protected from, or exposed to light; and even, as observed by JANIN, both eyes may be completely amaurotic, and yet both pupils will vary in diameter with the intensity of light to which they are exposed. This phenomenon can only be explained by referring to the nerves supplying the different parts of the organ. The iris, being chiefly supplied with ganglial nerves, will often retain its faculty of motion, when the efficient cause of the disease affects the optic nerves at any place between their origin and their communication with the third pair; or when the affection of the optic nerves within the cranium does not leave the retina altogether deprived of sensibility, although the impression cannot be conveyed to the brain, the subsidiary nerves, particularly the third and fifth pairs, and the branches from the cavernous and lenticular ganglions, still bestowing sufficient sensibility and mobility on the iris to admit of motion on being stimulated.

31. Besides the size of the pupil, it is necessary to attend to the characters of the motions of the iris. This part may contract on one side, or in one part, drawing the pupil to one side, or giving it an irregular appearance. It may also seem as protruded towards the cornea, or it may appear sunk inwards, and have a funnel-like shape. (MACKENZIE.)

32. The appearance of the humours of the eye is also important. In hydrocephalus, or when occurring in young subjects, the pupil has the natural black hue. But in elderly subjects some degree of glaucoma accompanies amaurosis. This appearance is in general unfavourable.

33. The presence of the marks of injuries about the face and head is important, as marking probable injury of parts within the cranium, or of some nerves subservient to the perfect condition of the organ. The character of the countenance, the shape of the head, the state of the vessels of the head and eyes, and the general habit of body, require to be noticed. The inference which ought to be drawn as to the exact nature of the disease will be very different when it is met with in the plethoric, the highly fed, and the indolent, from that which will be deduced from its occurrence in

the emaciated, or exhausted subject. The probable predisposing and exciting causes should also be investigated, as they have an obvious relation to their effects. Attention should be directed to the previous habits, indulgences, ailments, occupations, and modes of life of the patient, &c., with the view of throwing light upon the causes and pathological relations of the malady.

34. The *duration* of the disease is extremely various. It may, in slighter cases, be only of a few hours' or days' continuance; may altogether disappear, either spontaneously or from treatment, and never afterwards recur; or it may return after an indefinite period, from errors in diet, disorders of the digestive organs, or from the operation of the causes usually producing the disease. It very frequently continues all the life of the patient.

35. IV. STAGES, GRADES, AND FORMS.—The stages of amaurosis are *incipient* and *confirmed*. In the former the sight is generally not altogether lost, although more or less impaired. Treatment will often retard or check the progress of the disease, and sometimes even bring about a perfect cure. But the blindness may be complete from the first: in this case, medicines are generally without effect. In the *confirmed* stage, the disease is usually stationary; but the sight is not always altogether lost: the patient often retaining a perception of light and shadow, or even of objects, when illuminated or strongly contrasted. When this power of distinguishing any object or colour is still retained, even in the slightest degree, the amaurosis is said to be *incomplete*. When the patient is insensible even to the presence of light, the disease is *complete*. It may be limited to one eye, in the incipient or incomplete states; or it may affect both equally, either in an incomplete or complete form. It may also be incipient in one eye, and confirmed in the other; and it may be more or less complete in either. It may likewise, in one or other of these states or forms, assume a *recurrent* or *remittent* type; but such cases are comparatively rare.

36. But, besides these stages and grades of the disease, other forms occasionally present themselves, which will be more fully noticed in the sequel. It may be *Idiopathic*, depending upon changes, either *functional* or *organic*, taking place *primarily* in the nervous apparatus of the eye, and existing *simply*, and without any other associated lesion: or it may be *complicated* with lesions of adjoining parts, or with other diseases of the eye, particularly of its humours, more especially with glaucoma and cataract. It may also be *consecutive* of other diseases; most frequently of organic changes within the head, or in the vicinity of the orbit, as in apoplexy, paralysis, &c. And, lastly, it may be *symptomatic* of, or supervening to, pre-existent disease of distant parts, particularly of the abdominal viscera; or it may be occasioned by pregnancy, and more rarely by diseases of the puerperal state. It is not infrequently thus symptomatic of colic from lead, accumulations of fecal matters in the large bowels, hypochondriasis, &c.

37. According to these *states* of the disease, its different *species* will next be considered, and the treatment which is appropriate to each of them will subsequently be pointed out: for it is obvious, that the success of remedies will, in this very difficult and variously complicated disease, mainly depend upon the strict appropriation of remedies to its different varieties and states.

38. *Spec. 1st, Functional Amaurosis.*—This form of the disease generally arises,—1st, from suspension or exhaustion of nervous and sensorial power; from various local and constitutional causes (§ 13.); from inordinate excitement or exertion of the visual organs; from mental exertion, watchfulness, and sedentary habits; from the deleterious action of mineral, vegetable, and animal poisons, as lead, mercury, narcotics, &c.: 2d, from venereal indulgences; excessive secretions and evacuations; depression of the vital energies from diseases of debility and exhaustion: and, 3d, from temporary diminution of the local circulation; from simple congestion, or occasional determination of blood in the veins or arteries; and from the irritation or disturbance of the digestive organs, or of some other of the abdominal viscera.

39. The *symptoms* of this species are, chiefly, more or less obscuration of vision, occurring slowly or suddenly, the visus nebulosus, and muscæ volitantes; a somewhat contracted pupil, and clear state of the humours; equal imperfection of sight in both eyes; pale, languid countenance, and depression of the eyes in the orbits; a languid, small, or weak pulse; increased dimness, or sudden abolition of sight upon quickly assuming the erect, from the horizontal posture. An improved state of the sight after a light meal, or grateful stimulus; nervous headaches; weak digestion, sluggish state of the bowels, flatulency, foul or loaded tongue, and indisposition for, as well as incapability of, physical or mental exertion or occupation; weakness in the joints; occasionally nocturnal emissions, &c. in the male, and leucorrhœa in the female.

40. This species of amaurosis may be, 1st, *Primary*, and *uncomplicated*.—In this case it usually proceeds from causes which depress or exhaust the sensibility of the retina and its related nerves. 2d, It may likewise be *consecutive*; particularly of excessive secretions and discharges from the uterus, mammæ, kidneys, testes, and prostate; or from exhausting and debilitating diseases, as adynamic diseases, hæmorrhages, &c. 3d, *Symptomatic* of, or *complicated* with, hysteria, hypochondriasis, colica pictoria, diminished vital energy of the digestive organs, and all the various forms of indigestion; the presence of worms in the bowels; pregnancy; obstruction and accumulation of bile in the bile-ducts or bladder, &c.: and, 4th, *Metastatic*, or supervening upon impeded or checked secretions and discharges; in which cases it is generally accompanied with congestion, or determination of blood to the head, in which the eyes may partake, but not to an extent constituting inflammatory action or organic change; and it assumes a state nearly approaching to that characterising the next species.

41. *Spec. 2d, Amaurosis from active congestion.*—The existence of this species of the disease is more a matter of inference, than almost any other of those in which I have divided the disease. Yet it seems undoubtedly to exist; especially when amaurosis is consequent upon obstructed secretions and discharges, or the drying up of eruptions; upon frequent stooping, or wearing a tight neckcloth; upon fits of passion, when it occurs in plethoric persons; and after narcotic poisons.

42. The *symptoms* indicating it, are throbbing in the eyes, tinnitus aurium, turgescence of the vessels of the sclerotica and conjunctiva, a some-

what contracted pupil, and clear state of the humours; turgescence of the features, or lividity or bloatedness of the face; fulness of the jugular veins, prominence of the eyes, and impeded circulation through the lungs or cavities of the heart.

43. This form of the disease is seldom *primary* and *uncomplicated*. It is commonly *consecutive*, or *symptomatic*, generally of obstructed discharges, &c. (§ 12.), of disease within the head, particularly of sanguineous congestions, or effusions, and diseases of the lungs and heart. It not infrequently occurs transitorily from pregnancy, epilepsy, and hysteria; and more rarely from gout and rheumatism.

44. *Spec. 3d, Amaurosis from inflammation of the retina, and internal parts of the eye.*—In stating amaurosis to be often a symptom merely of retinitis, I am supported by the opinions of many of the best British and Continental writers on the disease. But I believe it very seldom occurs, that the inflammation is limited to this membrane. but that the choroid and iris generally participate with it in the morbid action; and that, when they, on the other hand, are thus affected, the retina is also inflamed. Amaurosis is therefore a consequence of inflammation of the internal structures of the eye: but does inflammation of these parts uniformly produce amaurosis? It is not always consecutive of iritis; and I believe that the retina may be inflamed, and yet but very slight amaurotic symptoms may be occasioned thereby, particularly during the early stages of the retinitis. It is chiefly when the inflammatory action has produced some degree of organic lesion of the affected parts, that amaurosis is manifested.

45. This form of amaurosis generally proceeds from nearly the same causes as the foregoing (§ 10—12.). It may be produced by syphilis, mercury, eruptive and continued fevers, cold in any form acting upon the eyes or face; suppressed discharges, or eruptions on the head or behind the ears; injuries of the eye and adjoining parts; concussions, and the usual causes of inflammation in other parts.

46. The *symptoms* vary with the extent and intensity of the inflammation. In its slighter states, the progress of the disease, and of the symptoms, is insidious and slow. In these cases, little or no pain is complained of, either in the eye or in the head. The pupil is more commonly contracted than dilated, and the spectra are usually luminous, but sometimes not very sensibly so. With this slight and often chronic state of inflammatory action, the amaurosis may be increasing fast, and the observation of vision very great, and yet the symptoms may not be distinctive; if we except the appearances furnished by the sclerotic, which, in retinitis, as well as in iris, abounds in red vessels, converging in distinct lines, and forming, by their delicate reticulations, a red zone round the cornea, and which thus furnishes the only symptom, that can be depended upon, of slight or incipient retinitis.

47. In the more intense states of inflammation of the internal parts of the eye, the amaurosis is attended with painful vision; intolerance of light; sparks of fire, or drops of a red colour falling from the eyes; flashes of light; pain darting through the head, either from, or to the bottom of the eyeballs; the pupils are dilated, and the humours

thick or muddy; and there are more or less acceleration of pulse and constitutional disturbance.

48. This species of amaurosis is often *primary* or *idiopathic*; it may also be *simple* or *complicated*. When it occurs in a complicated form, it is, most frequently, associated with iritis, with meningitis, with eruptive or continued fevers, and with rheumatism, gout, or syphilis. It may also occur *consecutively*, and from *metastasis*, particularly after the disappearance of exanthematous eruptions, as in the measles, small-pox, erysipelas; of chronic eruptions; and after the suppression of habitual or periodical discharges, secretions, and evacuations (§ 12.).

49. *Spec. 4th, Amaurosis from advanced disorganization of the retina and adjoining parts.*—Disorganization of these parts is usually a result of inflammation. But it is difficult to determine at what stage of the inflammation organic change commences. I am to consider it here as far advanced; yet, the inflammation that occasioned it may be still present. The *causes* of this species are the same as those of the foregoing; but the *symptoms* are somewhat different. The vision is more obscured. A film seems interposed between the eye and field of vision. The pupil is sluggish, and it is often scarcely dilated; it is frequently irregular. The margin of the iris sometimes partly adheres to the capsule of the lens. The sclerotic is often very vascular, and even livid, from the enlarged and loaded state of its veins, which are very numerous and tortuous. The shape of the eye is sometimes changed, particularly in the most advanced cases; it is prominent in some parts, and depressed in others. The eyeball is occasionally, also, softer or firmer than natural.

50. This form of amaurosis is always *consecutive* of the *second* and *third* species, more particularly of the latter; and hence, participates in many of their characters (§ 41—48.), and occurs under many of the same circumstances as they. It is occasionally *complicated* with cataract, with opacities of the cornea, or with disorganization of parts within the head.

51. *Spec. 5th, Amaurosis from external injuries of the eyes.*—A blow on the eyeball will not infrequently occasion blindness, without producing any apparent injury of its visible parts. It is difficult, or altogether impossible, to ascertain the nature of the mischief that has been inflicted. The concussion of the organ, and the lesion of the sensibility of the retina and optic nerve, may, in some of the cases, particularly when the consequent amaurosis is merely temporary, constitute the principal or only change. In more permanent and severe instances, it is very probable that the delicate connections of the retina with the adjoining parts are injured. Ecchymosis may also be occasioned, or inflammation may supervene. In these cases the pupil is either dilated, or of an irregular form; and according to the extent of injury will the phenomena partake of the characters which have been assigned to the *third* and *fourth* species of the disease.

52. *Spec. 6th, Amaurosis from disease within the head affecting the functions of the optic nerve, or other nerves subservient to the sense of sight.*—It is obvious that disease within the cranium, either of the substance of the brain, or of its membranes,

producing pressure of, or interrupted circulation in, the parts with which the optic nerve is connected at its origin, or during its course, or acting in a similar manner on the nerve itself, will produce amaurosis. In these cases it is a *consecutive* affection — a symptom merely of disease, often existing for a long time previously. I have already alluded to the nature of these lesions, and to their extreme diversity (§ 17, 18.). Perhaps the most common and the most interesting of them are organic changes of the pituitary and pineal glands, hæmorrhage, sanguineous congestion, aneurismal and other tumours, &c. In these cases it is very common to find cerebral symptoms complained of long before the sight is affected; and to observe the gradual accession of the disease either in one or both eyes; or first in one and afterwards in another, with complete loss of vision, followed at last by changes of the structure of the eye.

53. When organic lesion of the pituitary and pineal glands has occasioned the disease, judging from the cases recorded by DE HAEN, WENZEL, VIEUSSENS, LEVEQUE, WARD, RULLIER, and RAYER, both eyes are generally gradually and equally affected, after the existence of cerebral symptoms, chiefly consisting of pain and weight referred to the more anterior parts of the head; of a repugnance to exertion, apathy, loss of memory, and weakness of the mental energies. In cases of sanguineous congestion, or hæmorrhages in the situations referred to, the attack is sudden, and the blindness is often not the most remarkable symptom.

54. In some cases resulting from organic disease within the head, cerebral symptoms, particularly those of an acute kind, are not complained of until the amaurosis is far advanced. In its progress, objects frequently seem to the patient disfigured or perverted. In many cases of amaurosis from organic change of the skull, membranes, or brain, the affection commences with intolerance of light, strabismus, giddiness, luminous spectra, convulsive motions of the eyes and eyelids, contracted pupil, and turgescence of the blood-vessels of the eyes, loss of hearing, smell or taste, or both, violent headach, rapidly followed by complete amaurosis, protrusion of the eyeball, and abolition of the external senses and of the powers of mind.

55. This species of amaurosis is often *complicated* with, or preceded by, epilepsy, paralysis, apoplexy, otorrhæa, or disease of the ears, hysteria, and various nervous affections. It is chiefly by attending to these antecedent disorders, or other slighter cerebral symptoms, that we can form any idea of the nature of the amaurosis. The appearance of the eye, and particularly of the pupil, is not to be depended upon; for, although the pupil is usually dilated and immoveable, the exceptions are too numerous to admit of considering it as an uniform occurrence.

56. *Spec. 7th, Amaurosis from disease of the optic nerves, or of their sheaths.* — This species of amaurosis always advances slowly, generally commencing in one eye, with a black cloud, which grows more and more dense, great disfigurement and perversion of objects, without pain of the head or eye. There is, however, a sensation of pressure at the bottom of the eye, as if forcing the eyeball from its socket. The pupil is generally,

from the commencement, much dilated, and angular, from irregular action of the iris. By degrees, according to BEER, glaucomatous change of the vitreous humour supervenes, and afterwards of the lens itself, but without any varicose affection of the vessels of the eye. At last the eyeball becomes somewhat smaller than natural, but complete atrophy does not ensue.

57. *Spec. 8th, Amaurosis from lesions of branches of the fifth nerve, &c.* — The experiments of BELL and MAGENDIE first threw light upon this cause or form of amaurosis. I believe that it is by no means infrequent. Four cases of it have come before me in private practice; in three of which the principal trunk or branches of the ophthalmic nerve were implicated. In one of these the amaurosis was very slight; in the other two it was very considerable, although not complete, and was a consecutive phenomenon of very extensive disease. I saw two of them, in consultation with respectable practitioners in my vicinity. The fourth case very recently occurred in a member of my own family. In it the frontal branch on the right side was pressed upon by a common boil; the sight of the eye was nearly altogether lost, but was soon restored when the boil broke.

58. Numerous cases are on record, in which partial amaurosis is said to have occurred after injuries and wounds of the eyebrows, cheeks, and forehead; or from the irritation and extraction of diseased teeth. The appearance of the disease from these causes was noticed by MORGAGNI, PINEL, BEER, WARDROP, TRAVERS, PENADA, RIBES, &c., before the functions of this nerve were so well known as they are now. Its occurrence from wounds of the eyebrows is mentioned even in the writings of HIPPOCRATES.

59. Amaurosis from these causes is, in some rare instances, *complicated* with facial neuralgia, toothach, rheumatism of the face, and tumours or abscesses developed in the vicinity of the eye, and within the cranium in the course of the fifth nerve. I met with it in a case of otorrhæa, terminating in caries of the bones, and extensive disease of the internal parts in the vicinity. It is also, in some cases, accompanied with paralysis of the upper lid, and in others with paralysis of different muscles of the eye. In these cases, the third or sixth nerves have, most probably, been chiefly affected. When the ophthalmic nerve is affected within the cranium, it is difficult, if not impossible, to determine the particular seat of lesion from the amaurotic symptoms. Facts have not been observed in sufficient number, and with requisite precision, to admit of any statement being made respecting the pupil and motions of the iris in this species of the disease. I believe, however, that serious organic, as well as functional, lesions of the organ may supervene to it.

60. There are other varieties of amaurosis particularised by BEER, WELLER, SANSON, and other German and French writers, some of them of rare or doubtful existence, or at least referrible to the species into which I have here divided the disease. From amongst these I may enumerate the following: — Gouty amaurosis; rheumatic amaurosis; amaurosis from the sudden repulsion, or cure of cutaneous eruptions, or old ulcers; amaurosis from suppressed secretions and evacuations; puerperal amaurosis, &c. It is

evident that these are only occasional, and by no means frequent, causes of the disease, which ought to be kept in recollection by the practitioner, but which can act only by inducing some one or other of the forms into which it has been divided; more particularly the *second, third, fourth, and sixth*. In as far as they may require a modified plan of treatment, they will receive attention in the sequel.

61. In addition to these, I may notice the *cat's-eye amaurosis* of *BERR*, which is only met with in the old, debilitated, thin, and emaciated; particularly those who are grey, or white-headed. At the commencement of this amaurosis, the iris retains its mobility; but it afterwards is slow and the pupil dilated. Deep in the bottom of the eye, a concave pale grey, or yellowish green, or reddish, variegated opacity is observed. The further the disease advances, the paler the bottom of the eye becomes, the paleness extending to the iris, until at last a slender vascular plexus—the ordinary ramification of the central artery and vein—may be discerned. With this state of the eye, decline or total abolition of vision is the consequence. This rare form of amaurosis seems to consist of a deficiency of the pigmentum nigrum, and of the tapetum of the uvea. It appears closely allied to far advanced glaucoma. This form of the disease is seldom or ever benefited by medical treatment.

62. V. DIAGNOSIS.—Amaurosis is liable to be mistaken for incipient cataract, and for glaucoma. When cataract is fully developed, the two diseases can scarcely be confounded. That a clear diagnosis should be made between incipient cataract and amaurosis is of the greatest importance in practice.—A. As to the impaired vision in both diseases at their commencement, it may be remarked that in cataract, the difficulty of sight increases very slowly, and is compared to a diffused mist, thin cloud, or gauze intervening between the eye and the object; whereas in amaurosis, the dimness or loss of sight is either sudden or partial, resembling a fly, spots, or motes covering parts of an object. However, a mist, or thin cloud, often is complained of in incipient amaurosis, and, increasing in density, at last deprives the patient of sight; but a complete deprivation of sight never occurs in cataract. As incipient cataract depends upon commencing opacity, generally at the centre of the lens, the appearance of a mist, &c., is generally most perceived when the patient looks straight forward; vision being more distinct when he looks sideways. This commonly does not obtain in amaurosis, although it sometimes does.

63. B. The degree of light which the patient desires is also important. When amaurosis depends upon insensibility of the retina, there is a great desire of strong light, and he sees the best at noonday, or when objects are brilliantly illuminated. The opposite of this obtains in cataract; for a strong light, causing the pupil to contract, the rays of light reflected from the object must pass chiefly through the central and more opaque part of the lens. In addition to this we should attend to the antecedent and attendant symptoms of amaurosis; especially vertigo, headach, disorder of the digestive organs, without which cataract usually commences.

64. C. Upon examining the pupil, incipient amaurosis presents either the jet-black colour of

health,—excepting in the *cat's-eye amaurosis* of *BERR*, which is of rare occurrence, and presented to us under circumstances not to be mistaken,—or a paleness or greenness, visible only when the eye is examined in particular directions, constituting amaurosis with *glaucoma*. This appearance evidently arises from deficiency of the pigmentum nigrum, and incipient dissolution of the hyaloid membrane; and when it amounts to a high degree, constitutes the *cat's-eye amaurosis* of *BERR*.

65. Mr. MACKENZIE remarks on this subject, that attention to the following circumstances will generally enable the observer to distinguish glaucomatous amaurosis and cataract:—1st, The opacity in glaucoma is always greenish, whereas in incipient cataract it is always greyish. 2d, The opacity in glaucoma appears seated at a considerable distance behind the pupil, or deep in the vitreous humour; whereas in lenticular cataract, the opacity is close behind the pupil. In posterior capsular cataract, the opacity is deep in the eye, but is always streaked; whereas the glaucomatous reflection is always uniform, never spotted, nor radiated. 3d, Upon close examination of the surface of lenticular opacity by means of a double convex lens, it is seen slightly rough, somewhat dull, never smooth or polished—forming, in these respects, a striking contrast to the appearances presented by glaucomatous opacity. 4th, The eyeball, in glaucomatous amaurosis, always feels firmer than natural; while in cataract it presents the usual degree of firmness. 5th, Glaucoma proceeds very slowly in its course, scarcely increasing for years; whereas the vision, in cataract, much more rapidly declines, and keeps pace with the growing opacity.

66. D. The mobility of the iris is a principal source of diagnosis. For, in incipient cataract, the contractions of the pupil are as extensive and as vivid as in health; but, in incipient amaurosis the pupil is either dilated and fixed, or its motions limited and slow. Also, in the latter disease, the movements of the eyeballs and eyelids are often imperfect, or difficult; whereas no impediment of this description exists in cataract. In many cases of amaurosis, we observe a want of direction in the eyes, or a slight degree of strabismus, not infrequently with a want of power over the motions of the upper lid,—symptoms that never occur in cataract.

67. VI. PROGNOSIS.—This is unfavourable. When the cause of the disease is evident, and it is merely functional, or simply congestive or inflammatory, and the patient young, or in the prime of life, but under middle age, a complete cure is not infrequent. This may be obtained although much more rarely, even when the loss of sight is total. But in every case the predisposing and exciting causes, and the effects of remedies, must be taken into account in forming our prognosis. Much more commonly only partial amendment is produced. Amaurosis is generally less unfavourable when suddenly, than when slowly induced. When the pupil is only slightly dilated, still moveable, of its natural form, the eyeball neither firmer nor softer than in health, and no glaucoma present, the prognosis is obviously more favourable than when the pupil is fixed in the states either of expansion or contraction, or when the eyeball is either boggy or preternaturally hard, or when the bottom of the eye presents a greenish opacity.

68. If the attack has been sudden, and nearly complete, or if objects are seen in a perverted or distorted form, or double; if the amaurosis be attended with want of power in the muscles of the eyeball or eyelids, we should suspect that the cause consists of general or partial pressure, or other organic disease, within the cranium, which, although indicating both danger and the permanent loss of sight, will sometimes be removed by energetic treatment. If one amaurotic and paralytic symptom slowly supervene on another, we should dread the gradual development of tumours, cysts, exostosis, &c. within the head, the situation and nature of which can be suspected only, and chiefly from the nature of the attendant or preceding symptoms. But in all these the prognosis is necessarily very unfavourable.

69. VII. TREATMENT.—In order to employ remedies in this affection with any degree of benefit, it will be necessary to direct them with a very particular reference to the pathological conditions of the eyes, the brain, and system generally, as now pointed out. Having separated the disease into the foregoing species or varieties, in order that the treatment may be pointed out with greater precision, I proceed to detail the measures which I consider appropriate to each, conformably to the most experienced authors, and to my own observation.

70. A. *Of the first species.*—The treatment of this, the most strictly functional form of the disease, should have strict reference to the causes which induced it,—whether those acting directly on the organ, or those which act indirectly, and in consequence of inducing disorder of other parts. When amaurosis proceeds from direct causes, either of a depressing or an exhausting nature, the appearance of the eye, as well as the character of the symptoms, require an attentive examination, chiefly with a view to ascertain the existence of inflammatory action, or even active congestion of the internal parts. A complete removal of the causes must be insisted on; and, if no symptoms indicative of inflammation (§ 46.) exist, but, on the contrary, debility, a languid circulation, *muscae volitantes*, or dark spectra, &c. (§ 39.), tonics and stimulants, both internally and externally, are required. A light, nutritious, and invigorating diet, with change of air, repose of the organs, moderate exercise, vegetable, and afterwards mineral tonics, and the usual means of improving the digestive organs, and promoting the functions of the bowels and secreting viscera, are in these cases chiefly to be depended on. Small doses of *strychnine*, or of the extract of *nuxvomica*, may also be given (FORM. 541. 565.). When, however, we find evidence of congestion or increased vascular action of the internal parts of the eye to have been induced, the means to be employed in the next species must be resorted to.

71. When this species of amaurosis proceeds from interruption or disorder of the digestive functions, as indicated by the symptoms of such disorder, by a foul tongue, acidity and flatulence of stomach, and torpid bowels (§ 39.), *emetics*, as recommended by RICHTER, OTTO, SCHMUCKER, FLEMING, SCARPA, and MACKENZIE, may be exhibited; but, unless the symptoms of interrupted digestion, or of indigestible and injurious substances remaining upon the stomach, or of biliary obstruction, be unequivocally present, little ad-

vantage will be derived from them: in plethoric persons, or where these causes of disorder do not exist, they may be even injurious. Amaurosis from disorder of the digestive organ is generally imperfect, and sometimes slight; and its progress slow. In this form, SCARPA recommends *full vomiting* to be produced by the patient taking a spoonful, every half hour, of a solution of three grains of tartar emetic in four ounces of water; and, on the following day, opening powders to be commenced with, consisting of an ounce of bitartrate of potash and one grain of potassio-tartrate of antimony, divided into six equal parts. The patient is to take one of these parts in the morning, another four hours afterwards, and a third in the evening, for eight or ten successive days. The effects of these are, nausea, and increased evacuations from the bowels; and, in the course of a few days, vomiting. If, during their use, the patient should complain of a bitter taste in the mouth, vain efforts at vomiting, and no improvement of sight, the emetic, as at first directed, is to be again taken; and this is to be repeated a third or fourth time, if the bitter taste, acid eructations, nausea, &c. continue. The repetition will often at last succeed in procuring the discharge of a yellowish or greenish matter from the stomach, to the relief of the head and eyes.

72. The stomach, and through it the liver, having been thus acted upon, the following resolvent pills of SCHMUCKER are to be taken, to the extent of fifteen grains, night and morning.

No. 11. R Gum. Sagapen., Gum. Galbani, Sapon. Venet., \mathfrak{ss} 3j.; Rhel 3jss.; Antimonii Pot.-Tartratis gr. xv.; Ext. Glycyrrh. 3j. Divide in Pilul. gr. iij.

These pills are to be continued for four or six weeks. Instead of these, the pills recommended by RICHTER may be prescribed.

No. 12. R Gum. Ammoniac, Gum. Asafoetid., Sapon. Venet., Rad. Valerian., Summit. Arnicae, \mathfrak{ss} 5ij.; Antimonii Potassio-Tartratis gr. xvij.; Syrup. q. s. M. et divide in Pilulas gr. iij.

From twenty to thirty grains are to be taken three times a day for some weeks.

73. If these succeed in improving the state of the stomach and sight, SCARPA directs means calculated to strengthen the digestive organs, and nervous system: such as the daily exhibition of bark and valerian, more particularly in periodic amaurosis; a light, digestible animal diet, with a moderate quantity of wine, and wholesome air and exercise. He further prescribes, as advised by THILENIUS and MORIGGIA, the *vapour of liquor ammoniac* directed to the eye, with the view of exciting the nerves of the organ; and employed, three or four times a day, so as to occasion each time a copious secretion of tears. In conjunction with the use of this vapour, other external stimulants, as blisters to the nape of the neck, behind the ears, or to the temples; irritation of the nerves of the nostrils by sternutative powders; and, lastly, sparks of electricity may be resorted to. Various volatile substances, spirituous, saline, and oleaginous, have been recommended to be applied to the eyes, either in a state of vapour, or of solution, and dropped into them, by WARNER, SAGAR, MANARDUS, DUNCKLER, CHOMEL, ST. YVES, and SCHMUCKER; but these require to be cautiously resorted to. Substances of a like description have also been prescribed in the form of *collyria*, in this species of amaurosis. PLENCK recommends for this purpose a drachm of the *crocus metal-*

extract of *nux vomica*, may be prescribed both internally and topically. (FORM. 542. 565.) The connection of the disease with hysteria, hypochondriasis, obstructions of any of the abdominal secretions, chiefly requires the combination of antispasmodics with aperients; chlorine, iodine, or sulphureous baths; the occasional exhibition of a brisk purgative; and, afterwards, the warm salt-water bath, tonics with stimulants, and strict attention to the secretions and functions of the digestive organs, and to diet, air, and exercise. After all obstruction is removed, cold bathing, or chalybeate or salt-water baths, followed by frictions of the cutaneous surface, may be used.

80. *B. Of the second species.*—When amaurosis is attended with those symptoms which I have described as marking active congestion of the internal parts of the eye, or of the head or thoracic viscera (§ 41.), a very different treatment to that enjoined above is requisite. In the first species of amaurosis, *blood-letting* is generally prejudicial—it has even caused the disease; but, in the congestive species, blood-letting, either general or local, or both, according to the circumstances of the case, is indispensable. In every form of the disease the means of cure must be regulated by the apparent vascularity of the eye, the plethoric state of the countenance and body, and by the state of the arterial pulse, examined, not only at the wrists, but also in the carotids and temples.

After depletion, to an extent which the well-informed practitioner will be led to adopt according to the particular characters of the case, the promotion of the alvine discharges, and of the cutaneous and alvine secretions, will next require his attention, as salutary modes of derivation and evacuation; and afterwards the application of blisters, setons, issues, and other counter-irritants, behind the ears, or to the nape of the neck, will generally be necessary to complete, or to render permanent, the cure. The ointment of the potassio-tartrate of antimony, moxas, the mezereon issue, the actual cautery to the nape of the neck, or to the occiput, and errhines, have severally been recommended by eminent continental writers in this state of the disease.

81. The *shower-bath*, sponging the head with cold water night and morning, the *cold douche*, or the effusion of a stream of cold water on the head, are means which ought not to be neglected in those cases in which the congestion is of an active character, or approaches to the inflammatory state. When this form of the disease is consecutive of interrupted or suppressed discharges or evacuations, the restoration of these must be attempted. If the menses be suppressed, leeches to the pudenda, or the insides of the tops of the thighs; or bleeding from the feet; the preparations of iodine, aloetic purgatives, and other emmenagogues; stimulating pediluvia, and the *hip-bath*, with the other means usually resorted to in cases of amenorrhœa, are to be employed. If it proceed from suppressed hæmorrhoids, leeches may be applied to the vicinity of the anus, and purgatives, with calomel, colocynth, and aloes, prescribed. If it supervene on the disappearance of gout or rheumatism, sinapisms and irritating cataplasms may be directed to the extremities, and free alvine evacuations procured; after which colchicum, combined with alkalies or magnesia,

and, in some cases, with ammonia or camphor, may be exhibited, or aconitum combined with antimonials, and purified sulphur; and rubefacients applied behind the ears, or to the temples. When it appears after the suppression of eruptions, and healing of old ulcers, the use of the tartar emetic ointment, setons, and perpetual blisters behind the ears, are particularly indicated. If it follows a suppressed cold, WELLER recommends weak sternutatories, with calomel or hellebore.

82. Mr. TRAVERS has very justly remarked, that a loss of balance of the circulation, producing undue determination of blood to the head, often exists independently of general plethora, and is aggravated by sanguineous depletion. It is sometimes even met with in corpulent persons; and is not infrequent after over-excitement and chronic inflammation. Instead of requiring loss of blood for its removal, this state of the disease demands an equalisation of the circulation, by promoting the various secretions, and the derivation of the excessive supply to other parts by the means now stated, assisted by an abstemious and regular diet, gentle exercise in the open air, the promotion of the functions of the liver and bowels, and the means usually employed to benefit the general health. Even in some of these cases, the local means noticed above, as the vapours of ammonia, &c. (§ 73.), may be serviceable in restoring the tone of the vessels of the eyes.

83. *C. Of the third species.*—Inflammation of the internal parts of the eye, particularly of the retina, requires decision, in the more intense cases, and a vigorous but judicious application of the usual antiphlogistic remedies. In the slighter cases, the exact nature of the disease may be mistaken for either of the foregoing species. Slight or slow inflammatory action may exist without any material affection of the pulse, or pain of the organ; but the appearance of the blood-vessels of the sclerotic, and the state of the iris, will often indicate its presence when other signs are wanting. When the attack is acute, both general and local depletions are required. In these cases PLENCK has advised the performance of arteriotomy; SPIGELIUS and HOFFMANN of blood-letting from the frontal vein; and SAUVAGES from the jugulars. But vascular depletion is not to be relied upon alone. Active evacuations from the bowels, determination to the skin by small and repeated doses of antimonials, and the use of the tartar emetic blister or plaster behind the ears, or to the nape of the neck, are to be also adopted.

84. If these means fail of producing a very decided improvement in a very short time, we must endeavour to affect the mouth slightly with mercury, without producing salivation. In order that this may be done with rapidity, and with as little mercury as possible, the preparations of this mineral to be employed will be advantageously combined with James's powder, or compound powder of antimony, and small doses of camphor. The treatment is, in such cases, similar to that usually resorted to in iritis. Much of the advantages to be procured from the use of mercury in this form of amaurosis, as well as in iritis, depends upon the promptitude with which it is employed. In this TRAVERS, LAWRENCE, MACKENZIE, and others agree. Indeed, the use of calomel, and other preparations of mercury, either alone, or cam-

lined with other substances, has been adopted in the inflammatory states of amaurosis, from the time of HELSTER and BOERHAAVE. BANG, HUDSMAN, SCHMUCKER, ZUCKER, and BREITING, agree in recommending them. BOETTCHER advises the combination of calomel with belladonna; and HEY, calomel with camphor: both being judicious modes of combining this medicine. MEAD, STAHL, HOFFMANN, and ISENFLAMM, advise the production of salivation; but I agree with TRAVERS in considering the affection of the mouth as sufficient. The use of mercury is much praised by BEER in such cases, as well as in those of a syphilitic origin, or which are complicated with engorgement of any of the abdominal viscera. Care should be had not to employ mercury in debilitated or scorbutic persons, and when the eye is soft or boggy. Many of the continental writers, and Mr. WARE, prefer the bichloride to other preparations. It is best exhibited, as recommended by VAN SWIETEN, dissolved in brandy, and taken in a basin of sago or gruel. It may be continued for six weeks, or even longer.

85. The success which has resulted from the exhibition of the *oleum terebinthinæ* in iritis induced me to prescribe it, after depletions, in two cases of this form of amaurosis; and with satisfactory results in both. In persons far advanced in life, in scrofulous subjects, and in debilitated persons, this oil is certainly a less hazardous medicine than the mercury exhibited so as to affect the system.

86. In the slighter or more chronic inflammatory forms of amaurosis, particularly when met with in the description of subjects just now alluded to, much circumspection is necessary in the use of depletions: general blood-letting is here inadmissible, particularly when this class of patients are ill fed, and live in close and ill ventilated streets and apartments in large towns, and local depletions only are indicated. In cases of this description, and under these circumstances, the *oleum terebinthinæ* will prove a valuable medicine; and even, although we may deplete thus locally, the internal exhibition of tonics, with a nutritious diet, attention to the alvine secretions and evacuations, and a wholesome air, will prove the most beneficial remedies.

87. This form of amaurosis, as well as the preceding, will occasionally supervene from suppressed evacuations and eruptions, and, more rarely, from misplaced gout and rheumatism. (§ 48.) In such cases, the treatment already recommended, as appropriate to each of these (§ 81.), will be equally applicable here.

87. Besides the above means, it has been recommended by BROMFIELD, to insert an issue in the scalp; by HOFFMANN, to apply leeches to the insides of the nostrils; by numerous authors, to employ errhines and sternutatives, with the view of provoking a copious secretion from the Schneiderian membrane; and by as many others, to use the actual or potential cautery, setons, moxas, &c. to the nape of the neck, or to the occiput. Leeches and counter-irritants are safe, and sometimes useful, remedies in this and the preceding species; but errhines and sternutatives may be hurtful, unless the affection has arisen from suppressed discharges from the nostrils. They are most serviceable in the functional state of the disease. The safest that can be employed in this

species of amaurosis is the one recommended by the late Mr. WARE. It consists of ten grains of the hydrargyrus sulphuratus, well mixed with a drachm of common sugar: a small pinch of it generally produces a copious discharge of mucus from the nose.

89. *D. Of the fourth, and remaining species.*—When we have reason to suspect that the amaurosis depends upon advanced organic lesion of the internal parts of the organ, consequent upon inflammation, we should still bear in mind that, with the supervention of such lesion, whatever it may be, the inflammatory action seldom altogether subsides, but continues, more or less, in a chronic, atonic, or disorganizing form. Therefore the propriety of still having recourse to local depletions, particularly if these have been neglected early in the disease, to purgatives, derivatives, or revulsants; the cold douche to the head; and, afterwards, to the use of stimulating vapours, when we have reason to suspect that the change continues rather in consequence of lost tone of the vessels, and inaction of the absorbents, than from increased action. Under such circumstances, the vapour of camphor and acetic acid, or of the liquor ammoniæ, may be tried.

90. *a.* If the amaurosis have arisen from *external injury of the ball of the eye*, or concussion of the organ (§ 51.), the chief indication is to prevent, or to repress, increased vascular action, by the means already recommended; to attend to diet and regimen, and to keep the organ in a quiet inactive state for some time; after which, if the affection still continue, the treatment must be directed according to the particular lesion, functional or organic, that may have been primarily or consecutively produced.

91. *b.* When the history of the case leads us to suspect the dependence of this affection upon *disease within the head* (§ 52.), or tumours pressing upon the *optic nerve*, &c. (§ 56.), the treatment must necessarily be directed, according as the symptoms referable chiefly to the head may lead us to infer the nature of the primary lesion. If such symptoms, particularly the temperature of the head, and the action of the carotids, indicate the existence of congestion, interrupted circulation, or increased action, the treatment must be accordingly. But, under almost every circumstance, counter-irritation, and external as well as internal revulsants, will prove safe, and sometimes serviceable, means of cure.

92. If we have reason to suspect the formation of tumours; thickening, or other change, of the membranes or of the bones, particularly as a consequence of syphilis; and extravasations of blood, or of serum, within the cranium, or in the course of the optic nerves, &c. (§ 52.), the internal use of the preparations of *iodine*, and particularly of the *iodide of mercury* or of *potassium* (see FORM. 323, 324.), should not be overlooked. I have employed these preparations with much benefit in three cases of amaurosis connected with paralysis; two of them consequent upon apoplectic seizures. In the intervals between the courses of iodine, deobstruents, and alterative doses of blue pill, with the extracts of sarsaparilla and taraxacum, or with the decoction or other preparations of sarsaparilla, should be prescribed.

93. *c.* When the affection seems connected with

lesion of the other nerves subservient to vision (§57.), the treatment must necessarily depend upon the seat and nature of this lesion, and, in some rarer cases, upon the state of the associated derangement. If it be connected with neuralgia of the nerves of the face, disorder or irritation of these nerves may exist at their origin, or in their course through the membranes and bones of the cranium. The cause may also be external—in a diseased tooth or stump, or a partially separated external branch of the ophthalmic trunk of the fifth nerve. In all such cases, as well as in the other forms, states, and associations, of the fifth, sixth, seventh, and eighth species, which have been enumerated, the treatment must vary in each, and be directed according to the very numerous pathological conditions, which the well-informed pathologist will detect, either as their efficient causes, or as their related effects.

94. Throughout the treatment of this disease, the practitioner should keep the following facts in recollection:—1st, An appropriate, and hence successful, method of cure should have an intimate relation to both the remote and proximate causes of the disease, and the natural or morbid diathesis of the patient: 2d, It must be directed after a minute inspection of the eyes, and examination into symptoms connected with the head and the digestive viscera: 3d, It must be modified according to the nature of its related, associated, and symptomatic disorders: and, 4th, That much of the success will often depend upon the strict regulation of the patient's digestive and organic functions; upon diet and regimen; and upon a regulated exercise both of the organ of sight and of the body, with a pure and temperate air. Keeping these indications in recollection, the practitioner will modify and adapt the treatment to the presumed nature, seat, complication, and relations of the disease.

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AMENORRHŒA. See MENSTRUATION.

AMNIOS. See DROPSY OF THE AMNION.

ANÆMIA. See BLOOD, Deficiency of.

ANÆSTHESIA. See SENSATIONS, Morbid States of.

ANASARCA. See DROPSY OF THE CELLULAR MEMBRANE.

ANEURISM. See AORTA, Aneurism of; and ARTERIES, Morbid Structures of.

ANGINA. See CROUP. LARYNX, Inflammations of. PHARYNX, Inflammations of. THROAT, Inflammations of.

ANGINA PECTORIS. SYN. *Cardiognus Cordis Sinistri*, Sauvages. *Angina Pectoris*, Heberden. *Asthma Arthriticum*, Schmidt. *Diaphragmatic Gout*, Burton. *Asthma Dolorificum*, Darwin. *Syncope Anginosa*, Parry. *Angor Pectoris*, J. Frank. *Asthma Convulsivum*, Elsner. *Pnigophobia*, Swediaur. *Sternodynia Syncopalis*, Sluis. *Asthenia Pectoralis*, Young. *Stenocardia*, Brera. *Asthma Spastico-Arthriticum*, Stoeller. *Sternalgia*, Baumes and Good. *L'Angine de Poitrine*, Fr. *Brustbräune*, *Herzklemme*, *Brustklemme*, Ger. *Angina di Petto*, Ital. *Suffocative Breastpang*, Eng.

CLASSIF. 2. Class, Diseases of the Respiratory Function; 2. Order, Affecting the Lungs, their Membranes, or motive Power (Good). II. CLASS, I. ORDER (Author, see Preface).

1. DEFIN. *Acute constrictory pain at the lower part of the sternum, inclining to the left side, and extending to the arm, accompanied with great anxiety, difficulty of breathing, tendency to syncope, and feeling of approaching dissolution.*

2. This affection was not recognised as a distinct disease by medical authors, until Dr. HEBERDEN described it as such in the Medical Transactions of the London College of Physicians (vols. ii. and iii.); but the works of MORGAGNI and HOFFMANN show that they were not unacquainted with it in practice. It was also noticed by POTER (*Opera*, No. 22. p. 302.), under the head "*Respirandi difficultas, quæ per intervalla deambulantibus incidit*;" and he remarks respecting it, that the attacks were sometimes so severe that persons had been suddenly carried off by them. Obscure notices of affections, which probably were of this nature in some instances, may also be detected in authors from HIPPOCRATES downwards. From amongst these, the reader may refer to ARETÆUS (*Opera*, p. 7. Oxon. 1723), CÆLIUS AURELIANUS (lib. ii. c. i. p. 348.), BARTELETTI (*Methodus in Dyspnæam*, Bon. 1632), and others, adduced by ZECHINELLI (*Sulla Angina di Petto*, Pad. 1813), who supposes that the case of SENECA (*Opera*, t. ii. p. 136.), which he has himself described by the term *suspirium*, was actually this malady. Dr. CULLEN has passed Angina Pectoris over in his work; but it has been well described by Drs. FOTHERGILL, WALL, DUNCAN, BUTTER, PERCIVAL, DARWIN, MACBRIDE, HAMILTON, MACQUEEN, JOHNSTONE, HAYGARTH, PARRY, NICHOLL, and GOOD, in this country; and by JURINE, BRERA, LENTIN, DESPORTES, KREYSIG, RITTER, ZECHINELLI, and STOELLER, on the Continent; and by Dr. CHAPMAN, in America.

3. PATHOLOGY.—I. SYMPTOMS.—An attack of this disease is often preceded by considerable derangement of the digestive organs, especially by flatulence, acid or acrid eructations, or other symptoms of indigestion, with torpid bowels, pains in the limbs, and occasional spasms about the chest; but it frequently also attacks a patient, particularly when walking or ascending an eminence, without any, or with but slight, premonition.

4. *A.* In its *acute form*, the patient is seized with a sense of painful constriction of the chest, particularly at the cardiac region, about the lower part of the sternum, inclining to the left, and extending to the left, occasionally also to the right, arm—at first no further than the insertion of the deltoid muscle; but the pain often successively reaches to the elbows, wrists, and sometimes even to the fingers. This is the mildest form of the disease, and soon subsides with the disappearance of its exciting cause.

5. In the more violent form of the attack, the pain and sense of constriction in the chest, and pain in the left arm, which also frequently extends to the right, amount to excruciating agony; being likened, by LAENNEC, to the piercing of nails or the laceration by the claws of animals. This feeling is accompanied by a sense of syncope or suffocation, sometimes with suffocative orthopnea, convulsive dyspnoea, and palpitations; always with extreme anxiety, and a sense of approaching dissolution. The suffocative sensation is characterised by concomitant tightness and fulness of the chest, and flatulent distension of the stomach, and irritative feeling in this organ, which is relieved by eructations. During this period the pulse is variously affected, sometimes little changed, at other times extremely weak, irregular, or intermittent; and occasionally it is full, active, and bounding. If the attack has been induced by walking or exercise, the patient suddenly stands still, from a feeling that perseverance in either would produce a total suspension of living power. In the slighter attacks, or early in the disease, rest merely will often immediately remove it; but this is seldom the case in the protracted and severe forms in which it frequently occurs.

6. The paroxysm continues from a few minutes to one or more hours, according to the severity and the duration of the disease. When the malady has assumed a chronic form, and its attacks occur during the night, or when the patient is at rest, the paroxysm is less violent, but generally of much longer duration; whereas, when it is induced by exertion, &c., it is of extreme violence, but of short continuance: the average duration of the fit may be about half an hour. Upon its cessation the patient merely retains a slight feeling of the various symptoms, with numbness of the arms, particularly the left. When the disease is of short standing, the paroxysms occur at long intervals, which are gradually shortened, until there is but little exemption from them, and the affection assumes a less acute character.

7. *B.* The *chronic form* of the disease is characterised by the circumstance of its being frequently a consequence of the acute; by the occurrence of the fit from the slightest causes, and after short or imperfect intervals of exemption; by its recurrence when the patient is at rest or asleep; and by its much longer duration, but less extreme violence. Even if this form be induced by exercise, rest has little influence in shortening its duration, as in the preceding; and the paroxysm has been protracted, not only for some hours, but even for several days. Palpitation of the heart, irregular and intermitting pulse, are more frequently concomitants of this state of the disease than of the other. In the case of a very eminent and learned member of the profession, whom I

long attended in this form of the disease, the attack has often continued as now described, with little remission, for several weeks. Sometimes the irregularity of the pulse is observed only during the paroxysm; but in some cases it is continued, as Dr. FOTHERGILL has correctly remarked, during the intervals, particularly when they are marked by imperfect relief.

8. This form of the disease may also occur primarily. It has twice presented itself to me in this manner. During the severity of the attack, leipothymia, a feeling of dissolution from the intense agony, and these followed by palpitations, and an irregular state of the pulse, generally occur. In some cases the agonizing pain extends, not only to the arm or arms, but ascends also up the throat and lower jaw, accompanied with a severe sensation of spastic constriction. In the majority of cases the above sensations are only present when excited by motion, by assuming suddenly the erect posture, or even by attempting to read; a neuralgic kind of pain generally, however, being felt under the sternum, and extending to the arms: but in some cases, and in two which occurred to me, the exacerbations were often referable to no very evident cause, they sometimes occurring during the night, although the above causes generally induced them.

9. Notwithstanding the remarkable distress characterising the paroxysm, this disease, particularly in its acute state, sometimes does not early affect the constitution, or entail any permanent lesion; the patient often enjoying tolerable health in the intermissions, and performing all his functions naturally, and without embarrassment, until shortly before an attack. After its protracted continuance, however, the vital energies of the frame, particularly as they are manifested in the digestive and circulating organs, give way. Marked disorder of the chylopoietic viscera, attended with various dyspeptic symptoms, occasionally with great irritability of the stomach and bowels, impeded respiration, anxious and pale countenance, flabby state of the integuments and muscles, marked derangement of the circulation, œdema, dropsy, &c., at last supervene. But it more generally happens that the patient is carried suddenly off by a paroxysm before this state of the system is occasioned; or he sinks under the complicated derangement proceeding from an attack, and from some one of the organic changes which the continuance and repeated fits of the disease had induced.

10. II. CAUSES.—1. *Predisposing*.—This disease usually attacks the middle aged, and those beyond it; and men much more frequently than women. Of nearly one hundred cases, about seventy were upwards of fifty years of age; and seventy-nine out of the number were males; nearly one half terminated fatally, and almost the whole of them suddenly. It has been said also to occur more commonly in robust and corpulent persons with short necks. But JURINE and CHAPMAN dispute this. My own experience agrees with theirs in respect of its being equally common in persons of a spare as of a full habit. It is most prevalent in those of gouty and rheumatic diathesis, and who lead an indolent, or studious and sedentary life, or who have been subjected to much and continued anxiety and distress of mind, or indulged in much food, and spirituous or other

liquors. JUNINE and PARR state that they have scarcely met with it under fifty years of age. The most violent and distinctly marked case of it which ever came before me occurred in a gentleman at the age of thirty-four. During 1821, I attended an unmarried lady, aged twenty-six, who laboured under it in a slighter form; and recently, in 1830, another single female, at the age of twenty-five, came under my care, with the disease in its most violent grade. In both these females it seemed perfectly unconnected with uterine disturbance, menstruation being regular, and no tendency to hysteria having at any time evinced itself, or could be detected, my attention having been directed to this point. They both ultimately recovered, after a long treatment, and the employment of very decided measures. Nearly all the cases which have come under my observation were more or less referable to mental causes, particularly to disappointment, anxiety, and other depressing passions. Dr. HAMILTON conceives that there is an hereditary disposition to the affection. If we consider it to be of gouty origin, as contended for by BUTLER, MACQUEEN, RITTER, STOELLER, THILENIUS, ELSNER, and CHAPMAN, an hereditary disposition may be also conceded. But, although very satisfactory proofs have been adduced by these authors, and particularly by Dr. CHAPMAN, in an able paper he has recently published on this disease (*American Journ. of Med. Sciences*, No. xiii. p. 67.), yet it does not seem always to depend upon gout. Of the four cases which occurred to Dr. BLACK, of Newry, one only was subject to gout (*Med. Chir. Trans.* vol. vii.).

11. 2d, The disease is usually excited by walking, especially walking against the wind, or up hill; by ascending a flight of stairs, or any acclivity, particularly when the stomach is full or distended by flatus. It is also readily induced by either the exciting or the depressing passions, and by whatever perturbs the mind or occasions emotion. It may also be induced by the most trifling causes, in some susceptible and irritable habits, as by gentle walking, coughing, speaking, or reading aloud; by suddenly assuming the erect posture; by straining at stool; or even by a meal, however moderate, &c. It may also occur in a state of absolute repose, particularly when the disease has become chronic; and the patient may be roused from sleep by an attack.

12. I have seen it occasioned by rapid changes of temperature, particularly by a rapid change to great cold; but different persons seem differently affected by extreme states of atmospheric temperature. In some slight cases the fit has been shortened, by the patient struggling to overcome it, by frequently attempting to make a full inspiration; but this has also failed. The patient is incapable of making this attempt in the more severe paroxysms.

13. III. DIAGNOSIS.—Angina pectoris is more liable to be confounded with asthma than with any other disease. But a close attention to the phenomena attending upon both affections, will readily disclose a very great difference between them. The paroxysms of asthma always come on during the night, or at the close of the day: they are characterised by a heavy dyspnoea, wheezing, and cough, are relieved by expectoration and exposure to fresh air, and subside gra-

dually towards morning. They are not excited in the same way, nor by similar causes, nor marked by the acute and peculiar pain in the sternum and left arm, which is distinctive of angina pectoris. The stethoscope and percussion furnish us with no signs peculiar to the disease under consideration, unless it be complicated, as is sometimes the case, with organic lesion of the heart and lungs, or with effusion of fluid within the cavity of the pleura or pericardium, when they materially assist us in ascertaining the nature of the complication; and they also serve, by enabling us to ascertain other affections of the heart, to distinguish between it and them.

14. IV. PROGNOSIS.—In recent cases, of no very violent character, recovery will frequently take place under judicious management. But when the disease has become inveterate from neglect, or from being associated with, or from having given rise to, organic lesion, and when it has appeared in a decayed constitution, or has been preceded by other diseases of the heart or lungs, an unfavourable result should be apprehended sooner or later to take place: but the period of its occurrence is uncertain; and the event is generally sudden—sometimes like an electric shock; the movements of the heart being instantly arrested. This issue is often occasioned by a full meal, or by exercise or mental emotions; but it also occurs in old or chronic cases, when the patient is at rest, and apparently uninfluenced by any circumstance or occurrence. When it is followed by symptoms of effusion of fluid within the thorax, or oedema of the extremities, a fatal termination is seldom far distant.

15. V. PROXIMATE CAUSE, &c.—Notwithstanding the number of examinations which have been made after death from this disease, but little light has been thrown upon it. This is not so much owing to the absence of morbid appearances as to the extreme diversity of those which have been observed. Like epilepsy or dyspnoea, it has presented almost every lesion to which the organs which it affects are liable. Many of these may be viewed as accidental concomitants, or as concurrent causes; and not infrequently as results of the repeated functional disturbance occurring during repeated attacks. In several instances, not the slightest morbid appearance could be detected: but more frequently the heart and the large vessels in its vicinity have presented marks of disease, generally varied in its nature, and opposite as to its characters. The most common of these are ossification of the coronary arteries; ossification of the valves of the heart or of the arterial trunks; enlargement of some of the cavities of the heart, either with diminished or increased thickness of their parietes; but most frequently with softening, paleness, and tenuity of the muscular structure of the organ; varicose dilatation of the coronary veins (BRERA); depositions of adipose matter, to the extent of impeding its functions; effusions of serum, blood, &c. into the pericardium or cavity of the pleura, &c. (FOTHERGILL, BLACK, &c.) It has justly been remarked, by my friend Dr. Uwins, "that there is scarcely any malformation of the heart or its blood-vessels, that has not been occasionally found after death, from what would be considered angina pectoris: while, on the other hand, individuals have fallen victims to the affection, fully marked, and the most accu-

rite post mortem examination has not been able to detect the slightest indication of structural derangement." — (*Compend. of Theoret. and Pract. Med.*) — In some cases the only morbid appearances observed have been in other, and distant organs, from that which seems to be, if not the chief seat of the disease, at least the organ chiefly affected in its functions by it — the heart and large vessels having been altogether exempt from lesion. These appearances were adhesions of the serous surface of the lungs to adjoining parts; serous effusions into the pleura; thickening of the respiratory mucous surface; dilatation of the bronchi; oedema of the intervesicular cellular tissue of the lungs; abscess and tumours in the mediastinum; ossification of the cartilages of the ribs (WICHMANN, JAHN); tubercles, enlargement, scirrhus, &c. of the liver (PENCIVAL, LATHAM, BRERA, and WALKER); scirrhus of the pylorus, &c.

16. These lesions serve less to throw light on the precise nature of the disease than an attentive examination of the morbid phenomena during the life of the patient, and a calm appreciation of their relations, particularly with respect to the agents tending to diminish, remove, or to exasperate them. This affection has been considered by many authors as spasmodic, "although the part immediately concerned seems not to have been designated or understood." Dr. CHAPMAN remarks, that this hypothesis is rendered probable, by the general complexion of the disease — its causes, symptoms, and cure — and by its analogy to other disorders confessedly of this character.

17. Dr. FOTHERGILL supposed it to be occasioned by obesity, and particularly by a collection of fat about the heart; he also considered that it was sometimes symptomatic of water in the pericardium or cavity of the thorax. PARRY, JENNER, BURNS, KREYSIG, BOSTOCK, and some others, have viewed this affection as a species of syncope occasioned by the accumulation of blood in the heart, from an ossification of the coronary arteries. Drs. HOSACK and FORBES conceive that it most frequently arises from a plethoric state of the blood vessels, more especially from a disproportionate accumulation of blood in the heart and large vessels. To the first and second of these opinions it may be objected, that there is no obvious connection between the effect and the cause; for, as the cause is permanent, the effect should be continued, or at least present but little abatement, whereas the intermissions between the paroxysms are often characterised by a return of the healthy functions. It may be further stated, in opposition to this hypothesis, that many fatal cases have occurred in which this particular lesion was not found on dissection. LAENNEC states that he has examined several subjects who had laboured under this disease, and in none of them did he find the coronary arteries ossified. Besides, cases are recorded by MORICAW, SENAC, WATSON, CORVISART, ANDRAL, and others, in which ossification of these vessels were not productive, during life, of the sufferings characterising this disease. Indeed the coronary arteries are often found ossified in old persons, who had not complained during life of any affection of the heart, and who certainly never were attacked by this malady. As to the last of the above opinions, viz. that adopted by Dr.

HOSACK, Dr. CHAPMAN has very justly observed, "that even allowing the fulness and irregularity of the circulation contended for, which I am by no means disposed to do, as uniform concomitants, these I should take to be rather the effects of previous irritation or excitement, than the cause of the disease. Do we not also know, that such a condition of the vessels can exist without inducing angina pectoris? Were fulness and irregularity in the circulation only required for the production of the disease, instead of a rare, would we not have it as a daily occurrence? The fact, moreover, is, that angina pectoris, though oftener, perhaps, attacking the plethoric, is to be met with, as I have before said, in the feeble and attenuated." I may add to this, that the severest case of the disease which has ever occurred to me was that of a gentleman who had suffered severely from repeated and profuse hæmoptysis, and other symptoms of disease of the lungs. All these disappeared, but were followed, after some time, by angina pectoris. He was feeble and attenuated; but it was considered advisable to try the effect of bloodletting to a moderate extent: this gave no relief; it was repeated, but the symptoms were evidently aggravated by the measure.

18. Dr. JURIN considers the disease as a nervous affection; and he supports this opinion by referring to the sudden and unexpected manner of its attack — to its sudden termination in death, or restoration to health — the nature of the exciting causes of the paroxysm — the equality and regularity of the pulse, in the majority of cases, during the paroxysm — to the state of the respiration — to the painful sensation extending to the upper extremities — and lastly, to the circumstance of antispasmodics being beneficial in its treatment. The proximate cause, he adds, consists of an affection of the pulmonary nerves, disturbing the functions of the lungs, impairing the decarbonisation of the blood, and producing the pain in the sternum. This affection of the pulmonary nerves is communicated to the cardiac plexus, and deranges, secondarily, the heart and large vessels. The imperfect decarbonisation of the blood diminishes its stimulating influence on the heart and lungs, giving rise to repeated attacks, until it occasions the death of those organs, and then of the brain.

19. MM. DESPORTES and LAENNEC have adopted a nearly similar view of the disease, with this difference, that they consider its particular seat may vary according to circumstances. Thus, M. LAENNEC states, that when there exists, simultaneously, pain in the heart and lungs, we may presume that the affection is seated chiefly in the pneumo-gastric nerves; but where there is simply stricture of the heart, without pulmonary pain or difficulty of breathing, its site is in the nerves which the heart receives from the great sympathetic. But he supposes that other nerves may also be implicated at the same time, either by direct anastomosis or by sympathy; and that the branches of the bronchial plexus, particularly the cubital, are nearly always so affected. "The anterior thoracic originating in the superficial cervical plexus are, moreover, frequently implicated; and this is sometimes further the case with the branches derived from the lumbar and sacral plexuses, when the thigh and leg participate in the attack, which occasionally happens."

20. BRERA, ZECHINELLI, AVERARDI, and some others consider the disease to be occasioned by pressure of enlarged abdominal viscera on the heart, particularly of enlarged liver. JOSEPH FRANK conceives it to proceed from congestion of the cavities of the heart, occasioned by defective nourishment of its muscular structure; this defective nutrition itself resulting from previous inflammation, or from metastasis of gout or rheumatism, or from disease of the coronary arteries. (*Prax. Med. Univ. Præcep.*, t. ii. p. 260.) Respecting these, it may only be added, that the symptoms of angina pectoris are very seldom associated with enlargement of the abdominal viscera; and that, although they are much more frequently connected with the lesions alluded to by FRANK, this connection is by no means uniform, and is obviously not one of cause and effect; these lesions being rather coincident and partial results of the morbid state of the nerves, the altered sensibility of which constitutes one of the chief characteristics of the disease. It may be further stated, that Dr. DARWIN views it as a particular species of asthma, producing cramp of a peculiar kind in the diaphragm, or the other muscles of respiration; and Dr. BUTTER, while he conceives it to be of gouty origin, also refers it to the respiratory organs, particularly to the diaphragm. On these opinions it is unnecessary to comment.

21. Dr. CHAPMAN, to whose valuable paper I have already referred, states, "That the disease is a species of neuralgia, I am entirely persuaded, commencing for the most part in the pneumo-gastric nerve, and spreading in different directions, as other nerves may become involved. The derangement of the heart and other structures, with which it is sometimes associated, I hold to be coincidences or effects, and not the cause; since, among many reasons which might be adduced in corroboration of it, the disease has undoubtedly prevailed independently of such organic lesions, and, conversely, these have existed without occasioning it. But what is the immediate cause of the irritation of the nerves, inducing this neuralgic condition, giving rise to the subsequent phenomena of the disease? This is a question, which hitherto has not been clearly answered. My conviction is, that it is derived from irregular gout, which misplaced, thus operates as an irritant of the nerves, and probably first of those of the stomach."

22. It will be remarked from the foregoing, that JURINE, DESPORTES, LAENNEC, and CHAPMAN agree so far as to impute the disease to a species of neuralgia of the pulmonary and cardiac nerves, affecting the functions of the heart and respiratory organs, and extending by nervous connection to other parts; the organic lesions found in fatal cases being either coincidences, or effects of the disease; and after an attentive examination of the phenomena attendant on several cases of the affection which have come before me, I see no reason for differing materially from this opinion. With regard to the origin of this affection of the nerves in misplaced gout, I cannot so implicitly agree with Dr. CHAPMAN. The connection had been previously remarked by several physicians, as I have already stated, particularly by those whose names have been adduced, as well as by SCHMIDT and BURTON,—a circumstance favourable to the idea that it is founded in truth; and evidence of

it may even be found in Dr. MUSGRAVE's very excellent, but now scarcely ever noticed work, on Anomalous Gout. WICHMANN, however, has disputed this connection, and apparently with much reason. The notice which had been taken of this morbid relation is very candidly referred to by Dr. CHAPMAN, who has adduced the particulars of six cases in which this affection was evidently connected with gout, and in which recovery took place, after means had been successfully employed to invite this disease to the extremities. In the majority of those cases the patients had never previously suffered a gouty attack, and yet the means employed were successful in causing it to appear in the lower extremities.

23. But whether this disease is merely a form of misplaced gout, or an affection *sui generis*, which, when occurring in persons of a gouty diathesis, the induction of the regular gouty paroxysm in the extremities generally removes, my experience does not enable me to decide. In two persons whom I was lately called to treat, and with whom I have been long acquainted, I have no reason to suspect a gouty tendency; but the connection so satisfactorily established by Dr. CHAPMAN is evidently by no means infrequent, and is one which ought never to be overlooked during treatment, for I have remarked it in three or four instances. I believe that, in addition to the nervous character of the malady, the substance of the heart is often weak, thin, pale, and attenuated, or even softened, as if its substance were imperfectly and unhealthily nourished; and that its cavities, consequently, become occasionally dilated and congested. This view is accordant with the treatment generally found most successful in removing the disease. In a great proportion of the cases before referred to (§ 10.), of which I had made notes, chiefly collected from authors, dissection had been made in about fifty of those which were fatal; and out of this number nearly forty presented some degree of disease of the heart or large vessels;—most frequently ossification of the valves, coronary arteries, and aorta; and softening and emaciation of the heart. But whether these lesions were rather the consequence than the cause of the disease may be disputed.

24. VI. The TREATMENT of this disease necessarily respects, 1st, the measures which may be adopted during the paroxysm; and, 2d, those which should be resorted to in the intervals, with the view of effecting a perfect cure.

25. 1st, In respect of the means which may be employed during the fit, with the view of diminishing its duration and violence, no very precise or dogmatic direction ought to be given. Much will depend upon the peculiar characters of the case. The patient should always be placed in a state of tranquillity; and, particularly, if the countenance be pale, and the carotids pulsating feebly, in the supine or reclining position. The propriety of bleeding in the fit has been discussed by several physicians, and depends entirely upon the particular features of the attack. Where the symptoms are urgent, the patient plethoric or vigorous, or the pulse full and possessed of tone, there can be no doubt as to the propriety of the measure. Dr. READ (*Dub. Med. Trans.*, vol. i. p. 105.) has recorded a case which well illustrates the good effects of this treatment during the paroxysm. In

commended by PERKINS (*Mem. of Med. Soc. of Lond.*, v. iii.), in doses of a grain, with a quarter of a grain of opium, given twice a day, has a similar action; but it generally is necessary to give it more frequently, and to increase the doses. With the same view I have given the *hydrocyanic acid*, either simply, or combined with the oxide of zinc, forming a *cyanide of zinc*, and in one case particularly, with greater advantage than from any other means. I have reason to believe that the *cyanide of iron* will prove equally beneficial; but my experience of its effects is too imperfect as yet to allow me to speak decidedly as to its merits in this disease.

32. In a case which occurred to me a year since, I employed the *preparations of iron*, particularly the sesquioxide, being led to adopt them by the neuralgic characters of the case, and certainly with apparent advantage; but I should add that local means were also in operation at the same time. Wherever we have reason to suppose that the heart is debilitated, imperfectly nourished, or attenuated, the employment of tonics, particularly bark, and the preparations of iron, either alone or with antispasmodics, is particularly indicated, with strict attention to diet and regimen. *Auscultation* will be found of service, by intimating to us the particular state of the heart, which must in a great measure regulate our practice.

33. In a case of the disease which came under my care in 1824, I prescribed the *nitrate of silver* triturated with a vegetable extract, as recommended by SEMENTINI. This substance was continued in increased doses, until it occasioned an eruption, resembling nettle-rash, on the skin, — an effect noticed by this physician. The relief afforded by it, after this eruption began to appear, was decided. The patient is, at the present time in the enjoyment of tolerable health. At the period of my prescribing this substance, I conceived that its exhibition in this disease had originated with myself; but I subsequently found that it had been given in two cases of angina pectoris, with advantage, so long ago as thirty years, by Dr. CAPPE (*Duncan's Annals of Med.*, vol. iii.).

34. *Arsenic*, in the form of Fowler's solution, had been recommended in this disease by Dr. ALEXANDER (*Med. Comment.*, vol. xv. p. 373.), at a period antecedent to the introduction of the nitrate of silver into practice, as an internal medicine; and subsequently by Sir G. BLANE, who gave it with advantage, combined with digitalis and mercury (*Med. Chir. Trans.*, vol. iv. p. 136.).

35. Besides these, preparations of *bark* and other vegetable tonics have been recommended, either alone, or in combination with antispasmodics and anodynes. The *hydrosulphuret of ammonia*, in gradually increased doses (from eight drops to thirty) twice or thrice daily. The different preparations of *valerian*, the *ammonio-sulphate of copper* and *sulphate of quinine*, have likewise been employed, and occasionally with decided advantage: from the last of these, combined with an anodyne, particularly with opium and camphor, I have observed much benefit to be derived. The following formulæ may be employed.

No. 18. R. Infusi Rosæ Co. 3xj.; Quinina Sulph. gr. j.—ij.; Acidi Sulph. Arom. Mx.; Spirit. Æther. Sulph. Comp. 3j.; Tinct. Opii. Mxij. M. Fiat Haustus bis in die capiendus. Or,

No. 19. R. Extracti Anthemid. ʒij.; Quinina Sulph. gr. xij.; Massæ Pilul. Galban. Comp. ʒj.; Camphoræ Subactæ, gr. xv.; Syrup. Papaveris, q. s. Misce tenè et

divide in Pilulas xxiv., quarum capiat unam ad binas vel tres bis terve quotidie.

Having derived much advantage from the internal use of the *bi-borate of soda* in dyspeptic irritability of the alimentary canal, I was induced to employ it in a case of this disease which occurred to me a few years since, in doses of from twenty to thirty grains, given in the decoctum of althææ. It produced some relief; but the case was of the greatest severity, and little benefit, at least of a permanent description, was derived from any means which were adopted, excepting from the prussic acid.

36. *Mercurials* have received the sanction of BRERA. I have employed them in three cases, at first as an alterative; five grains of blue pill having been directed occasionally at bed-time, and subsequently so as to affect the mouth. In one of these the alterative dose had a beneficial effect upon the state of the stomach and bowels; but this was of short duration. When, however, pushed further, so as to affect the gums, great irritability of the system, fever, restlessness, and increased pain, anxiety, and sinking, were occasioned by it. In the other case, evidently connected with hepatic disorder, the blue pill was also at first given as an alterative on alternate nights. It affected the gums after a few doses, and afforded relief. It was now pushed with the intention of inducing salivation; and a somewhat violent effect was produced on the mouth, which was relieved upon exciting the salivary glands. Decided advantage was now procured; the bowels were kept open by means of a stomachic aperient, an issue inserted in one of the thighs, and change of air recommended. This patient perfectly recovered.

37. Where plethora exists, *blood-letting* in the intervals will be serviceable, with a light abstemious diet. When the paroxysms are apt to occur during the night, I have found an opiate given at bed-time, as recommended by Dr. HERBEN, of great service. In one case of this description I gave the *acetate of morphine*, in the dose of an eighth of a grain, but it occasioned such distressing feelings of sinking, and general depression of the powers of life, that stimulants were required; yet the same patient had experienced relief from opium combined with camphor. On one occasion I tried the effects of *iodine* in the form of the tincture; but although its use was adopted with great caution, seven drops only having been given three times a day, it occasioned an increase of all the symptoms, apparently owing to its irritating effects on the digestive mucous surface, and the idiosyncrasy of the patient. I may here notice the practice recommended by SCHLESINGER (*Hufeland's Journ.*, vol. i. p. 57.), consisting in the exhibition, every two hours, of the extract of the *lactuca virosa*, in doses of two grains, with half a grain of *digitalis*. What effect may we expect from the use of *colchicum*? Where the disease seems to originate in gout, the *colchicum* might be tried; but its use would require great circumspection. In my opinion, it should only be given in combination with stimulants, or antispasmodics and tonics, the tinctura colchici composita being the most promising preparation of it in such a case.

38. Although the patient labouring under this disease is generally incapable of any, excepting the most gentle, exercise; yet this should be

Paris, 1815.—*Laennec*, *Traité de l'Auscultation Médiate*. Paris, 1826.—*Chapman*, *American Journal of Medical Sciences*, vol. vii. Phil. 1831.—*Jolly*, in *Dictionnaire de Médecine et Chirurg. Pratiques*, &c., tom. ii. Paris, 1829.—*J. Hope*, *On Diseases of the Heart*. Lond. 8vo. 1832. p. 474.—*Bouilland*, *Traité Clinique des Maladies du Cœur*. Paris, 8vo. 1835. tom. ii. p. 491.

ANIMATION, SUSPENDED. See ASPHYXY.

ANTIPATHY. SYN. Ἀντιπαθῆς, Gr. *Antipathia*, Lat. *Der Widerwille*, die *Antipathie*, Ger. *Antipathie*, Fr. *Antipatia*, *Avversione*, Ital. *Antipathia Sensilis*, et *A. Insensilis*, Good.

CLASSIF.—4. Class; 4. Order (Good).

I. CLASS; IV. ORDER (Author).

1. DEFIN. *Internal horror and distress on the perception of particular objects, with great restlessness, or with fainting.*

2. This singular affection has merely been mentioned by CULLEN: it has, however, received more attention from SAUVAGES, LINNÆUS, VOGEL, PLOUQUET, PASSAMENT, and GOOD. The last named writer has needlessly divided it into two species—*sensile* and *insensile* antipathy; the former arising from objects or subjects which strike some one of the senses; the latter from the presence of an object, as soon as it comes within the sphere of some unknown influence, although unperceived by any of the senses.

3. There are numerous instances of singular antipathy on record; and most persons of observation have met with others in the course of their experience. The vulgar explain them generally by considering that the mother had experienced a fright from the objects of antipathy during the early months of pregnancy—and there are, no doubt, some facts which countenance the supposition. Thus, JAMES the First could not endure the sight of a drawn sword: Rizio was killed at the feet of Queen MARY when pregnant with him; and many other instances are mentioned by writers: but more frequently the persons themselves, who are thus affected, have experienced frights during the early months of infancy, or have had their minds early and indelibly impressed by certain subjects. PETER the Great had a fall from a bridge into the water, when an infant, and he could not afterwards endure to hear the rattling of a carriage passing over a bridge. Persons often retain the antipathy to the sight of crabs, lobsters, &c. which had been occasioned by fright from them in infancy or childhood. A man-servant in the author's family, advanced in life, had so great an antipathy to the sight of a mouse, that he would fly as fast as he was able from the place where one was seen; and become quite frantic at the sight. He stated that his mother, who likewise had an antipathy to mice, had been distressed by one thrown upon her when pregnant of him. Some persons cannot endure certain odours, from the faintness, or sickness, or sense of anxiety and distress they occasion. This appears to proceed from peculiar idiosyncrasy. I have likewise seen persons who could not touch certain smooth objects without feeling a peculiar shudder or horror, followed by faintness in some. This appears to arise from associations excited in susceptible or sensitive minds.

4. The most singular instances of antipathy are those which occur at the presence of objects unperceived by any of the senses, forming the *insensile* antipathy of Dr. GOOD. Thus, a cat concealed in a room has been known to produce most indescribable distress or horror in a person

who has not perceived it by any one sense, and has been, in no other way, informed of its presence. Some singular idiosyncrasy, doubtless, exists in such cases. SAUVAGES conceives that an effluvium proceeds from the animal, which, combining with that emanating from the person thus affected, occasions the unpleasant sensations upon his peculiar organisation or idiosyncrasy. This is, perhaps, the only opinion that can be formed on the subject.

5. The TREATMENT to be adopted for the removal of antipathies consists chiefly of resolute endeavours to overcome the morbid impression, by gradually accustoming the mind to its influence. Indeed, this is the only remedy that can be resorted to. Its adoption, successfully or otherwise, will entirely depend upon the mental energy of the patient. But there cannot be a doubt, that all impressions, however unpleasant or distressing, may be ultimately overcome by repetition, and a firm resolution either to endure, or not to be affected by them. The following works will furnish some curious information on this subject, with much trifling, silly hypothesis, and irrelevant matter:—

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ANUS. See RECTUM.

AORTA. SYN. *Arteria Magna*. *Aorte*, Fr. *Aorta*, die *grosse Schlagader*, *Hauptstamm aller Körperpulsadern*, Ger. ITS DISEASES.

1. This most important vessel is liable to all the lesions which have been noticed under the article ARTERIES. Some of them, however, when seated in this artery, are so important, particularly as respects their effects upon adjoining viscera, and their extremely dangerous consequences generally, that I propose to give a succinct account of them in this place. In doing this, I shall so far depart from the alphabetical arrangement, in respect of the subordinate heads of the subject, as may be requisite to the consideration of it in strict pathological order. Functional disorder, therefore, of this vessel will be first considered; next, inflammation; and, lastly, those lesions which usually result from inflammation, &c., as aneurism, constriction, obliteration of the vessel, &c.

2. I. NERVOUS PULSATION OF THE ABDOMINAL AORTA.—CLASSIF. II. CLASS; I. ORDER.—This is not an infrequent affection in weak, emaciated, and delicate persons, and particularly hysterical females. It is often associated with collections of air in the colon or stomach; and with accumulations of fecal matters or morbid secretions in the cæcum. It is also not infrequently consequent upon neglected dyspepsia.

3. i. The Symptoms are generally very characteristic of the nature of the complaint, and sufficiently serve to distinguish it from organic lesion of the vessel. The morbid pulsation is generally associated with nervous or hysterical symptoms, and is of a variable character. It is increased and diminished, sometimes without any evident cause,

but more frequently by mental or moral affection and emotions, or by constitutional causes. Disorders of the stomach, and irregularity of the uterine functions, also sometimes occasion or reproduce it; and I have observed it to follow upon the paroxysms of sinking or leipothymia, to which very delicate females are occasionally liable.

4. Upon pressing the stethoscope firmly over the aorta, the pulsation will be generally felt limited in extent, in its transverse or lateral direction, but it will be very perceptible in the course of the vessel from the bifurcation to the epigastrium. Instead of the gradual, steady, and strong motion or impulse attending aneurism, there is felt a vigorous and smart jerk; and the sound is either merely a slight whizzing, or is scarcely to be heard.

5. ii. The Treatment of nervous pulsation of the aorta will entirely depend upon the peculiar circumstances of the case in which it occurs. If the paroxysm is severe, the preparations of æther, assæfœtida, valerian, and ammonia, should be exhibited. I have seen much benefit afforded by strong coffee and green tea in these cases. The dependence of the affection on mental emotions indicates the propriety of advising a tranquil state of mind and a mild diet, with attention to the regular functions of the bowels. In cases evincing much irritability, mental or corporeal, hyoscyamus, conium, or the acetate or sulphate of morphine, in very small doses, particularly hyoscyamus combined with camphor, will be found useful. The preparations of morphine, however, should be cautiously administered in this affection. In a case which occurred to me some time ago, the sixteenth part of a grain only of the acetate of morphine was followed by unpleasant depression. Upon the whole, more advantage will accrue from the antispasmodics than from the sedatives just named; but in cases characterised by attendant irritability, the combination of substances belonging to both these classes of remedies will be of great service.

6. In all cases of this affection occurring in females, — and the great majority of them do occur in this sex, — the state of the menstrual discharge should receive the utmost attention. When the more distressing state of the affection subsides, a more tonic regimen and plan of cure may be adopted. The bitter infusions and decoctions, particularly those of calumba, cinchona, cascarilla, and chamomile, with the alkaline preparations, &c., and subsequently the preparations of iron, the shower bath, cold salt water bathing, chalybeates, regular exercise in the open air, and light nutritious diet, are the means chiefly to be depended on. When associated with other ailments, it is generally symptomatic of them, and therefore in such cases the treatment must be directed to the primary complaint.

7. II. INFLAMMATION OF THE AORTA. — SYN. *Aortitis*, *Aortite*, Fr. *Die Aortenentzündung*, Ger. CLASS. II. CLASS; II. ORDER. — Inflammation of the aorta occasionally takes place, but more frequently in a chronic than an acute form, and commonly consecutively of inflammation of the internal surface of the heart, and during the course of certain states of fever. The internal membrane of the vessel is sometimes alone inflamed, particularly when the disease takes place during fevers, or extends to it from the internal surface of the heart's cavities; but, in several cases, the subjacent cellular tissue, or both it and the internal membrane,

are chiefly affected. Aortitis seldom originates in the exterior coats of the vessel.

8. i. The CAUSES of aortitis are, — 1st, External injuries, as blows, contusions, falls, &c.; 2d, Violent, or too long-continued exertion; 3d, The use of hot, stimulating and acrid ingesta, spirituous liquors, and the introduction, by absorption or otherwise, of irritating poisons and morbid secretions, &c. into the circulation; 4th, The extension of inflammation from the heart, lungs, pleura, and pericardium, and the suppression of the eruption in eruptive fevers; — M. PORTAL states (*Anat. Med.*, t. iii. p. 127.) that he has met with it in cases of this description; — and, 5th, The causes which are productive of diseases of the heart.

9. ii. The SYMPTOMS can scarcely be stated with any hopes of enabling the practitioner to distinguish this disease, which is generally met with in conjunction with other maladies; particularly fevers, and inflammations of the heart, lungs, pericardium, and pleura, and disclosed to us only by *post mortem* examination. — a. When inflammation more or less acute extends along the descending aorta, the patient generally complains of a smarting and painful sensation in the direction of the spine, with a violent feeling of pulsation of the aorta; extending to the iliacs, without any appearance of enlargement or tumour; and unaccompanied by smallness of pulse in the remoter arteries, particularly those of the superior parts and extremities of the body. In the more acute cases, a sensation of heat is felt in the region of the vessel, sometimes with oppressive anxiety, leipothymia, or tendency to fainting, and always increased force and vivacity of the pulsations of the vessel.

10. b. The chronic states of this disease admit not of recognition until they have produced some one of those organic lesions, which occasioned marked obstruction of the circulation, or aneurismal dilatations. Dyspnoea upon slight exertion, emaciation, a pale yellowish tint of countenance, palpitations, hypertrophy and dilatation of the heart's cavities, oedema of the extremities, &c. are then the usual symptoms; and, although they furnish no certain evidence of the existence of this disease, yet when they are present, without the signs of narrowing of, or obstruction in, the orifices of the heart's cavities, and of the origin of the aorta, chronic disease of the aorta may be presumed to exist.

11. c. Aortitis, particularly in its chronic states, is occasionally complicated with hypertrophy of the left ventricle; the hypertrophy either causing the inflammation of the aorta, or the latter occasioning the former, particularly when the canal of the vessel is narrowed or obstructed by the effects of the inflammation. The other complications have been already noticed (§ 7—9.). It is chiefly owing to the more frequent occurrence of the disease in a complicated, than in a simple form, that it is so commonly overlooked, and so difficult to be ascertained, even when its existence is suspected.

12. iii. The PROGNOSIS of this disease, when its existence is presumed, is always unfavourable; on account both of our ignorance of much that is important respecting its symptoms, complications, and consequences, and of the fatal nature, sooner or later, of a great part of the effects to which it gives rise.

13. iv. The LESIONS produced by inflammation of the aorta are nearly the same as those I have enumerated in the article on the lesions of arteries. But as these changes, when affecting this important

quently has a neck of less diameter than the body of the sac. It seems to arise from a loss of elasticity and vital resistance of the portion of the vessel thus affected, in consequence of chronic inflammation and its effects. Owing to this cause the dilated portion of the vessel often presents many of the lesions described as consecutive of the inflammatory state, particularly reddened spots, minute fissures, atheromatous, cartilaginous, or ossific deposits, &c. This variety most commonly affects the ascending portion and arch of the aorta, and shoots out from its anterior or lateral parts. It often attains a considerable size, being sometimes as large or larger than the foetal heart, and generally inclines toward the right side of the chest. The dilated coats of the vessel are generally thicker, and but very rarely thinner than natural, unless in parts of the aneurismal pouch. When it arises from the root of the aorta, and the inner and middle coats burst, fatal extravasation takes place within the pericardium; no false aneurism taking place in this situation, owing to this part of the vessel being destitute of the cellular coat. Coagula do not frequently form in true aneurism as long as the current of blood in the sac continues to be not much obstructed; but when, owing to the narrowness of its mouth, or to retardation of the current of circulation in it, a partial stagnation takes place, coagula then form, frequently in an irregular or confused state, but sometimes in regular layers.

21. *C. Aneurism with ulceration of the internal coats, or false aneurism.* This variety arises, 1st, from rupture or fissures of the internal coats, owing to a loss of their vital cohesion, and to friability consequent upon chronic inflammation, associated with fungous, calcareous, and steatomatous deposits; and is often occasioned by accidents, or violent or sudden extension of the vessel; 2d, from ulceration following scrofulous and chronic inflammations, and the detachment of various depositions formed in the internal membrane. Cases have been recorded by LAENNEC and GUTHRIE, wherein fissures of the internal coats of the vessel, instead of producing aneurismal dilatation of the external coat, had dissected it from the fibrous tunic along the greater part of the length of the vessel; but such occurrences are very rare. This variety of aneurism cannot be formed at the commencement of the aorta: it is most frequently met with in the descending aorta, and the part opposite to the tumour or sac is generally not in the least dilated. Numerous instances of this variety of aneurism are recorded by modern authors.

22. *D. Mixed or compound aneurism.* After all the coats of the vessel have been dilated to a certain extent, forming either simple expansion or true aneurism, but, owing to the less extensible properties of the internal coats, conjoined with the effects of previous or existing inflammatory action, rupture or ulceration of them takes place, the impulse of the current of the circulation dilates still further the yielding cellular coat of the vessel, and a sac or cyst is thus not infrequently formed of this coat surmounting the primary aneurism. In this case the perforated internal coats form the neck of the cyst, which is always narrower than the cyst itself. When the ruptured part of the internal coats is considerable, so that the impulse from the current of blood prevents its

coagulation in this cyst; or, when in this, as in the other varieties of aneurism, coagulable lymph is not formed, so as to give rise to layers of fibrinous coagula within the sac calculated to support it, rupture of the sac will sometimes occur, and a diffused form of aneurism be the result.

23. *E. Of certain changes connected with aneurism of the aorta.* In some rare instances an aneurism of this vessel has been observed by HALLER, DUBOIS, DUPUYTREN, and LAENNEC, consisting of hernia of the inner coat through the ruptured fibrous coat. But it is obvious that aneurism, or tumours of this description, can seldom reach any considerable size without being either ruptured, owing to the more friable nature of the internal membrane, or confined by granulations and adhesions on its external surface, as shown by the experiments of HUNTER, SCARPA, and HOME. Solid small tumours, of the size of nuts, and closely attached to the aorta, have been described by CORVISART and HODGSON; the latter of whom supposes, with LAENNEC and BERTIN, that they are the remains of spontaneously cured aneurisms, their sacs having been filled with coagula, and their size afterwards diminished by absorption. The deficiency of the coats of the vessel, at their points of union with it, seems to confirm this opinion.

24. *a.* One of the most important changes connected with this disease is the deposition of fibrine and the formation of coagula on the internal surface of the sac. This process generally appears to proceed by progressive steps: and the deposition thus presents successive layers. The most central of these generally consist of blood only, more or less firmly coagulated; and each layer becomes firmer, drier, and paler, and more and more fibrinous, until the parietes of the sac is reached. In many cases, the most external layers chiefly consist of a whitish or greyish yellow fibrine, more or less opaque and friable. Sometimes they nearly resemble dried paste. The more recently formed coagula are soft, loose, and often only partially adherent to the layer next it. In some cases, blood seems infiltrated between the layers. Those next the vessel are generally united to it by a fine cellular-like tissue, furnishing appearances of a partial organisation. These depositions evidently proceed from the effusion of coagulable lymph from the internal surface of the aneurismal sac, and the partial stagnation or retardation of the blood, favoured by the narrowness of the neck of the sac, and the inflamed, uneven, or rugged state of its internal surface. When neither of these states exists, as is often the case in respect of the first two varieties of the disease, and particularly when the neck of the pouch is wide, neither coagula nor layers of fibrinous deposits are formed. When, however, inflammation of the internal surface of the dilated vessel or of the sac exists, and when a morbid secretion takes place from it, this will originate coagulation of a portion of the blood which comes in contact with it, and form, at the same time, a bond of union between the coagulum and the internal surface of the dilated coats of the vessel. The thickness and compactness of the coagula in aortic aneurisms are often remarkably great, and are chiefly to be imputed to this mode of origin. (See art. BLOOD.)

25. *b.* As the aneurismal tumour enlarges, it

generally occasions important changes both in itself and in adjoining parts. Those which respect the sac itself are chiefly thickening of the dilated coats, or thinning of them; and, in some instances, of both these changes in the same case. When the extension of the sac is considerable, or when moderate, if opposed by a firm substance, as cartilage or bone, ulceration or absorption of the parietes of the sac, inflammation of its more exterior parts and adhesion to adjoining structures; and, ultimately, as the tumour increases, perforation or rupture of the more prominent part, followed by fatal hæmorrhage, take place. The mode in which the aneurism bursts is different, according to its situation and the structure which it compresses and destroys; thus it not infrequently breaks by ulceration and perforation of a limited part of the sac. In some cases, particularly when it opens into a serous cavity, distinct laceration of the more exterior covering occurs; when it reaches a mucous surface or the skin, a slough is formed on its most prominent part, which is soon detached, and fatal hæmorrhage is the result. In the majority of such cases, the proper coats of the vessel may have been long previously destroyed at one part or other of the sac. But, if the aneurism form at the root of the aorta, rupture or ulceration of the proper coats of the vessel is followed by instant effusion of blood into the pericardium. Rupture of the aneurismal tumour, as respects the coats of the vessel, whether bursting into a hollow cavity or upon a surface, or forming a diffused aneurism, is generally transverse; but it is, in some cases, longitudinal, when it implicates all the coats of the vessel; or the rupture of the internal coats is transverse, and that of the external coat longitudinal; the former being almost universally transverse. The effects of aneurism upon adjoining parts require particular notice.

26. *F.* *Of the effects of aortal aneurisms on adjoining parts, and the situations in which they break.* The effects of aneurisms on adjoining parts necessarily depend upon their volume, firmness, and position. The heart, lungs, trachea, large bronchi, œsophagus, pulmonary artery, large veins, thoracic duct, and various organs contained in the abdominal cavity, may be displaced, atrophied, or partially destroyed, by the compression occasioned by them.

27. *a.* The vena cava is not infrequently more or less obstructed by the pressure of aortal aneurisms. M. REYNAUD (*Journ. Hebdom.* t. ii. p. 109.) met with a case in which this vessel was very nearly obliterated by an aortal aneurism, and M. BOUILLAUD mentions a case in which the superior vena cava was so much compressed by an aneurism at the arch of the aorta, that apoplexy was caused by it (*Dict. de Med., et Chir. Prat.*, t. iii. p. 403.); and CORVISART (*Journ. de Méd. par MM. Corvisart, &c.*, t. iii. p. 85.) and BERTIN, relate similar instances. The thoracic duct has also been destroyed by it, as was observed by M. LAENNEC. Mr. HONGSON and Sir A. COOPER met with cases in which the common carotid, and subclavian arteries were completely obliterated by the pressure of aortal aneurism.

28. *b.* When the pressure of an aortal aneurism destroys an adjoining viscus or structure, the ulcerative inflammation is often extended from the parietes of the sac to them, followed by the adhesion and absorption or ulceration of the parts

most compressed, until the tumour bursts, in one of the modes now stated (§ 25.), into one or other of the following situations: — Aneurism of the ascending or pericardial aorta generally opens into the pericardium: in three cases it bursts into the pulmonary artery, recorded by Dr. WELLS (*Trans. of Society for Impr. of Med. and Chirurg. Knowledge*, vol. iii. p. 85.), M. SUE (*Journ. de Méd. Contin.*, t. xxiv. p. 124.), and MM. PAYEN and ZEINK (*Bul. de Fac. de Méd.*, No. 3. 1819.). Aneurism of the arch of the aorta may break into the trachea, œsophagus, pleural cavity, or into the pericardium. That of the descending aorta generally bursts into the pleura, œsophagus, posterior mediastinum, or into the lungs. Aneurisms of the pectoral aorta most frequently burst into the left pleura; they have, however, been known, but in two instances only, — recorded by M. LAENNEC and Mr. CHANDLER, — to open into the spinal canal, having destroyed the bodies of the vertebræ, which are generally more or less injured in cases of aortal aneurism of considerable size. When seated in the ascending aorta, they often destroy the sternum; in both cases causing interstitial absorption of the bone, and often of the parietes of the sac and fibrinous layers of coagula in contact with it, so that the blood washes the bone itself. The cartilages usually resist the pressure of aneurisms, either altogether, or much longer than the bones; and when the periosteum is inflamed by the pressure of the aneurism, an ossific deposit is not infrequently formed around the tumour.

29. *c.* Aneurism of the aorta may, however, destroy life, even without breaking in any of the above directions; either by impeding the action of the heart and displacing it, or by compressing the organs of respiration, or by occasioning congestion, infiltration, and hepatization of the lungs; or by compressing the œsophagus, or injuring some of the thoracic ganglia; or it may destroy or compress the thoracic duct and large veins, as stated above (§ 27.), to a fatal extent.

30. *d.* The bursting of an aneurism of the aorta is not necessarily followed by instant death, as has been shown by MM. LAENNEC and MARJOLIN, and very recently by Mr. S. COOPER. In a case read by this very able surgeon, at the Medico-Chirurgical Society, where the aortal aneurism had pointed under the left shoulder-blade, but subsequently broke into the œsophagus, several pounds of blood were discharged by vomiting and stool, yet the patient lived for many months afterwards, and pursued a laborious occupation; a second hæmorrhage at last proving fatal. When the sac of an aortal aneurism bursts, and the blood flows into a cavity or viscus, from which it is readily discharged, death usually is soon produced. But when the opening in the sac is so situated that the blood is effused into the cellular structure, and what was before a true or encysted abscess becomes a diffused one, life may be prolonged for some days or weeks, or even longer. This, however, will depend upon the situation in which the rupture takes place, and the nature of the parts into or upon which the blood is effused. When the sac of an aneurism is ruptured, the laceration is generally in the same axis, or nearly so, with the opening into the sac, owing to the impulse being greatest in this direction, unless a divergence is occasioned by

of the vertebræ, under the left shoulder-blade, and pushes out this part. The strong pulsations always present in the tumour indicate its nature. Notwithstanding, it may subside, or altogether disappear for a time under an appropriate treatment. Previous to the appearance of the tumour, the symptoms are, as already shown, extremely fallacious.

37. In the advanced stages of aneurism of the thoracic aorta there are generally coughs with mucous or bloody expectoration, dyspnoea, and even orthopnoea, dysphagia, attacks of spasmodic suffocation, pain in the left shoulder, axilla, inner side of the arm, and ascending up the left side of the neck, with pricking pains in the tumour, and sometimes with a sense of whizzing or rushing at the top of, or under the sternum, and occasionally sensible to the hand. A dragging downwards of the larynx is sometimes complained of. All febrile symptoms are generally absent. Although these are the rational symptoms which are most to be depended upon, they must be viewed with those reservations which I have particularised in the preceding paragraphs.

38. 2d, When the aneurism is seated in the abdominal aorta, acute pain is complained of in the lumbar region, occasionally shooting into either hypochondria, and downwards into the thighs and scrotum. It is generally constant, but is also sometimes intermittent. It is often exacerbated into violent paroxysms, being dull and fixed in the intervals. It is aggravated by constipation, change of position, or pressure on the loins, and is unattended by any sense of heat in the part. In some cases there is also numbness of the lower limbs, as in that recorded by Mr. Mayo (*Med. Gaz.*, April, 1829), where the aneurism was situated between the crura of the diaphragm and the dorsal pains were excruciating. The patient often complains of severe fits of colic, accompanied with spasm of the abdominal muscles, and occasionally there are nausea and irritation of the stomach, but with little loss of appetite. Constipation is always present. Decubitus on the left side or back often produces great distress, and occasions palpitation, which generally subsides upon turning on the face or right side. Coldness, formication, pricking, and numbness of the lower extremities, are not infrequent; and in some cases paraplegia has occurred, with involuntary evacuations of the urine and faeces.

39. The tumour may not become perceptible externally; but as it increases it will press injuriously upon, and sometimes displace, one or other of the abdominal viscera, particularly the stomach, liver, and even the heart. When the tumour can be detected externally, it has generally been on the left side, nearly on a level with the last dorsal vertebra. When large, it often impedes the action of the diaphragm, and thus deranges the respiration. In some cases it has pressed upon the pericardium, and thus had the double pulsation of the heart communicated to it. (See Cases by Drs. GRAVES and STOKES, *Dub. Hosp. Reports*, vol. v. p. 24.)

40. *b. Signs furnished by auscultation.* — Dulness of sound upon percussion of the upper sternal portion of the chest and cartilages of the right ribs, although present in aneurism of the pectoral aorta, also occurs in other lesions of the thoracic

viscera. Dr. ELLIOTSON states, that a thrilling sensation given to the hand only, or chiefly, when applied *above*, or to the right of the cardiac region, and a bellows-sound heard in the same situation, may justly give a strong suspicion of the disease. But that neither the bellows-sound nor the thrill, always occurs. In four cases out of seven he found both wanting. LAENNEC never observed the thrill before the tumour became visible externally. He considers that the chief diagnostic of aortal aneurism is a strong and single pulsation, discernible by the ear in the situation of the aneurism, synchronous with the pulse at the wrist, stronger and louder than the action of the ventricles, and unaccompanied by the sound of the auricles. When, however, the aneurism comes in contact with the pericardium, a double instead of a single pulsation of the heart is communicated to the tumour. This was remarked in the cases recorded by M. CRUVEILHIER, and Drs. GRAVES and STOKES.

41. Dr. HOPK observes, that it is unimportant whether the pulsations be *single* or *double*; for, though the latter, may be distinguished from the beating of the heart by unequivocal criteria, viz.: — “1st. The *first* aneurismal sound coinciding with the pulse, is invariably louder than the healthy ventricular sound, and, generally, than the most considerable bellows-murmurs of the ventricles.—2d. On exploring the aneurismal sound from its source towards the region of the heart, it is found to decrease progressively, until it either becomes totally inaudible, or is lost in the predominance of the ventricular sound. Now, if the sound emanated from the heart alone, instead of decreasing it would increase on approximating towards the præcordial region.—3d. The *second* sound actually does sustain this progressive augmentation on advancing towards the heart; and as its nature and rhythm are found to be precisely similar to those of the ventricular diastole heard in the præcordial region, it is distinctly identified as the diastolic sound.* The second sound, therefore, corroborates rather than invalidates the evidence of aneurism afforded by the first; for, if both sounds proceeded from the heart, both would, on approximating towards it, or receding from, sustain the same progressive changes of intensity.” (*Diseases of the Heart and Great Vessels*, p. 425.) Besides these views, with which I concur, the sound of the aneurismal pulsation is deep, hoarse, and of short duration, commencing and terminating abruptly, louder than the loudest bellows-murmurs of the heart, and of a rasping or grating character.

42. The sound of aortal aneurisms is generally audible in the back; and, when the descending aorta is the seat, it is louder in this situation than on the breast. If it presents the abrupt, rasping character, when heard on the back, the evidence of aneurism is complete; for, as Dr. HOPK observes, the loudest sounds of the heart, when heard in this situation, are so softened and subdued by the distance as totally to lose their harshness. This is in accordance with the opinion of M. BERTIN, who very correctly observes, that when the stethoscope is applied upon the sternum in aneurism of the sub-sternal aorta, and on the

* See art. AUSCULTATION and HEART, as to the sounds of this organ.

beneficial, exercise on foot, or on horseback, especially the latter, must be avoided, and the utmost attention should be always directed to the digestive, secreting, and excreting functions.

49. When, in consequence of the energetic action of the heart, or the plethoric state of the circulation, or excessive action of the tumour, we determine on depletion, it ought to be performed in the recumbent posture; and the quantity as well as the manner of abstracting it should be such as to prevent any risk from too great depression, and its consequent reaction, whether of the heart or of the arteries. When the disease is attended with paroxysms of palpitation, depletion will be seldom of any use, and should therefore be cautiously employed in such cases. *Local depletions* may be resorted to when local pains are complained of; but, if the tumour has nearly reached any of the surfaces, they are seldom productive of benefit.

50. *Digitalis* has been generally recommended; it may be of some service when exhibited cautiously, and in moderate doses, but its full effects must be guarded against. The same remarks apply to *colchicum*. The *superacetate of lead*, combined with the acetic acid, and small doses of opium, is preferable to *digitalis*; and any hurtful effect that would arise from it will be prevented by an occasional dose of castor oil. In cases attended with palpitation of the heart, or inordinate pulsation of the tumour, I have prescribed the *sulphate of zinc*, and the *sulphate of alumina*, generally combined with small doses of *camphor* and *hyoscyamus*, with considerable benefit as palliatives. The acetate of lead may also be exhibited in a similar state of combination.

51. The application of ice to the tumour has been advised by Continental physicians; but it is often productive of much distress. A lotion, or repeated sponging, and occasionally the continued application of epithems may be employed; morally and physically, with careful prevention of plethora and sur-action of the heart, is indispensable; other means will be useful, chiefly in and either of those recommended in F. 157. 332. 336. may be adopted. Perfect repose, however, as far as they conduce to these states. By endeavouring in this manner to bring about the spontaneous cure of aortal aneurism, it may be supposed that we risk inducing the obliteration of the vessel: but I believe that this is not so likely to occur in the aorta as in smaller arteries; and even were it to occur, the result does not appear so hazardous as the continued increase of the aneurismal tumours; as sufficient evidence is on record of the possibility of a collateral circulation being established.

62. IV. RUPTURE OF ALL THE COATS OF THE AORTA, without aneurismal dilatation of the vessel, is a very rare occurrence, and has been met with only after violent external injuries, such as falls, or leaping from a great height, and from mental excitement, when the vessel has been previously diseased. In the *Ephemerides Physico-Medicæ Naturæ Curiosorum* (Dec. iii. Ann. ii. Obs. 70.), a case is recorded, in which it was ruptured by a blow on the hypochondrium. Mr. JAMES has recorded an instance of rupture and instant death in an active seaman, previously in good health, from jumping out of his hammock (*Lond Med. and Phys. Journ.*, vol. xviii.);

and Mr. ARNOTT has given a similar case, produced by a violent concussion of the body, from falling from a scaffold (*Ibid.*, vol. lviii. p. 19.). The most instructive case, however, of rupture of the aorta without aneurism has been minutely detailed by Mr. ROSE (*Lond. Med. and Phys. Journ.*, vol. lviii. 4to. p. 15.). In this case, as in the others, the coats of the aorta were all ruptured. They were more readily lacerated than usual, and the inner coat had a thickened stertomatous appearance. A case is given by Dr. HUME (*Glasgow Med. Journ.*, vol. iv. p. 148.), in which rupture of the aorta took place in a strong man upon getting into bed, followed by death in a few hours. An aperture, the size of a quill, was found in the vessel about two inches above its bifurcation. No account is given of the state of its coats.

53. V. CONSTRICTION AND OBLITERATION OF THE AORTA have been observed by several pathologists. STORCK (*Annales Méd.* ii. p. 262.), MECKEL (*Mémoires de Berlin*, 1756), SANDIFORT (*Observat. Anatom. Path.* iv. No. 10.), and Dr. GRAHAM (*Trans. Med. Chir. Soc.*, vol. v. p. 287.), with other recent authors, have recorded cases of extreme constriction of the aorta; whilst M. DESAULT (*Journ. de Chirurg.* 1792), M. BRASDOR (*Recueil Périodique de la Soc de Méd. à Paris*, t. iii. No. 18.), Dr. A. MONRO (*On Aneurisms of the Abd. Aorta*, p. 5.), Dr. GOODISON (*Dub. Hosp. Rep.*, vol. ii. p. 193.), M. VELPEAU, (*Revue Méd.*, t. iii. 1825., p. 326.), and M. REYNAUD (*Journ. Hebdom. de Méd.*, t. i. p. 161.), have adduced cases wherein this vessel was entirely obliterated, the circulation having been preserved by the anastomosis and enlargement of the arteries sent off above and below the seat of obliteration.

54. With respect to the origin of this lesion, it may be referred primarily to inflammation of the vessel. But various intermediate changes will necessarily have taken place, from the more immediate effects of inflammation to the complete obliteration of the vessel. It is probable that, in some rare instances, as in large arterial trunks, the transverse rupture of the internal membrane of the vessel, with the consequent effusion of lymph, and formation of fibrinous coagula, may so obstruct its canal as to give rise to its partial or total obliteration, without any aneurismal tumour having formed; and it is not improbable that obliteration or constriction of the canal may have proceeded in other cases, from the advanced stages of the spontaneous cure of aneurism; the deposition of fibrinous coagula, and the subsequent changes which had taken place in them, and the diseased coats of the vessel, having ended in obliteration, and the establishment of a collateral circulation.

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of
the
case of the Aorta alluded to by Pinnaquin, in his Medi-
cus Depressa, from various authors, to whom I have not
thought it necessary to refer.

APHONIA. See VOICE, *Morbid States of*.

APHTHÆ. See THROAT.

APOPLEXY. DERIV. and SYNON. *Apoplexia*,
from *ἀποπλίσσω*, peteculo. *Apoplexia*, Hip.
Letargum Reversio, Cels. *Morbus Attonitus*,
Lomnius. *Sideratus*, *Percussus*, Molinæ.
Schlagfluss, Ger. *Apoplexia*, Fr. *Accidentis*,
Colpo, Garrolo, Ital. *Apoplejia*, Pol.

CLASSIF.—2. Class, Nervous Diseases, 1. Or-
der, Comatose Affections (Cullen). 4. Class,
Nervous Maladies, 4. Order, Affecting
the Sensorial Powers (Good). IV. CLASS,
III. ORDER (Author, see Preface).

I. NOMOLOG. DEFIN. A loss of consciousness,
being, and voluntary motion, or in other words,
a suspension of the functions of the brain, respira-
tion and circulation being more or less disturbed.

PATH. DEFIN. Consists of defective vital energy,
with hæmorrhage, or derangement of the vascular
system of the brain, and their consequences.

2. DISTINCTIONS. There are few diseases which
present a greater variety of modes of attack, or
which depend upon a greater number of lesions
of the organ affected, than that now under con-
sideration. Its sources, modes of manifestation,
and morbid relations are numerous, and many of
them difficult of investigation. These circum-
stances have given rise to various attempts at
arranging the phenomena of the disease in such
a way as to indicate the relations which subsist
between the changes within the head, on which it
depends, and the mode and progress of attack.
Apoplexy has long been described as consisting
of certain forms, which have been distinguished
by some authors as the sanguine and serous, with
reference to the nature of the effusion, by others,
as the nervous and bilious, according to their idea
of the more immediate causes. By several writers
it has been, with more justice, divided into acute
or sthenic, and passive or asthenic, or entonic and
atonic, according to the state of the constitutional
or vital powers and respiration, and the degree
of vascular action accompanying it. All these
arrangements are, however, only partially founded
in truth in many respects they are entirely er-
roneous. Wherein they are either the one or the
other will appear in the sequel. M. CUVILLIER,
one of the most recent and best writers on the
disease, confines the term Apoplexy to the occur-
rence of spontaneous hæmorrhage in the brain,
and divides it into two species.—1st, That con-
sisting of a collection of blood in a torus part of
the brain, or on its surface, from a ruptured ves-
sel, and, 2d, That with sanguineous infiltration
into the softened structure—or capillary exuda-
tion into, and combined with, its substance.
The defect of this arrangement, as well as of
the pathology, particularly in regard to practical
purposes, must be apparent; for it will often be

impossible to ascertain, during life, whether ex-
travasion of blood has actually taken place, or
merely great congestion of the vessels, with or
without serous effusion, and many cases of true
apoplexy occur occasioning death, as well as
where complete recovery takes place, without
either of the lesions to which he imputes the
disease, having existed.

3. In the account which I will endeavour to
give of the disease, its common form of approach
and attack will be described, next, the different
modes in which the attack is made, distinguishing
the principal forms it assumes, and afterwards
will be noticed several important states of the
malady, arising from peculiar causes and ante-
cedent affections. When detailing the different
varieties and states of the disease, it will be made
manifest that the distinctions heretofore offered,
although occasionally obtaining, have no uniform
or even general relation to the lesions existing
within the head, that apoplexy, with the symp-
toms described as characteristic of serous effusion,
has been frequently found to proceed from
sanguineous extravasation; and that the san-
guineous has sometimes only presented slight
serous effusion: a similar objection being also
applicable to all the other distinctions above enu-
merated.

4. I. DESCRIPTION.—I. OF THE APPROACH,
OR PREMONITORY SIGNS, OF APOPLEXY. The
importance of recognising the approach of this
disease must be evident to the practical reader;
for judicious measures, employed at this period,
will often succeed in preventing an attack, or will
render it less severe, even when they fail of aver-
ting it altogether. The most common precursory
symptoms are, a tendency to sleep at unaccustomed
periods; a heavier sleep than usual, particularly
if accompanied with profound, laborious, or ster-
torous breathing, stridor of the teeth; nightmare;
convulsions of the frame, or cramps, a lethargic
feeling and drowsiness even during the waking
hours, more rarely, unusual wakefulness, pains
in different parts of the head, or general head-
ache or megrim; a sense of weight or fulness in
the head, or of pulsation of the arteries; inco-
herent talking, resembling intoxication; a turgid
appearance of the veins of the head, particularly
of the forehead, lividity or redness of the counte-
nance, slight or imperfect attacks of apoplexy;
loss of recollection; irritability of temper, or
unusual serenity or apathy of mind; a disposition
to shed tears; suffusion of the conjunctiva; col-
lapsed appearance of the alæ nasi, mottos floating
before the eyes, or dimness of vision (amaurosis);
scintillations, or bright or shining coruscations
before the eyes during darkness; inability to
follow the line in reading; double vision, or a
sharper sight than usual, difficulty in shutting or
opening the eyes; noises in the ears; dulness of
hearing, a sensation of an unusual factor; dry-
ness of the nostrils; continued sneezing; frequent
yawning; singultus; stammering, or indistinct
articulation, the substitution of one word for
another, or forgetfulness of words and names;
difficulty of swallowing, or fits of coughing upon
deglutition; leipothymia, vertigo, or a sensation
approaching to faintness; difficulty of writing, or
inability to spell the words, or to follow a straight
line, torpor, or numbness, or pricking of the ex-
tremities; itching, or formication of the surface;

pains of the joints or limbs; a feeling of fatigue upon slight exercise; partial or slight paralytic affections, chiefly of the muscles of the face, or confined to a limb or part of a limb, occasioning drooping of the eyelids, imperfect utterance, slight distortion of the mouth; an unsteady or tremulous gait; tripping upon ascending or descending a stair, or in walking; difficulty in voiding the urine, &c.

5. ii. THE CHARACTERISTIC SYMPTOMS, OR THOSE CONSTITUTING THE ATTACK. After one or more of the foregoing signs, or after the succession of two or more of them, and their continuance for a short or long period, the phenomena which constitute the disease supervene. Sometimes the premonitory signs are so slight, and of so short duration, as to escape notice, the attack being severe and sudden: at other times they are very remarkable, and several of them are grouped together, the attack advancing either gradually and severely, or suddenly, and disappearing rapidly; yet recurring after an indefinite time. The mode of approach and attack sometimes has a close relation to the state of internal lesion; but, occasionally no such relation can be traced, as will be shown and explained hereafter. The premonitory signs, as well as the early part of the attack, generally present more or less either of *augmented* or *diminished* vascular action, particularly about the head, according to the state of the vital powers. The character of the symptoms, therefore, in respect of degree of vascular action and constitutional power, should receive the utmost attention, as being our best guide to a successful treatment.

6. A. In the most *severe and sudden* forms of attack,—the *apoplexia fulminans* of the older authors, and some of the Continental writers of the present day; the *fortissima* of Dr. Cooke and others; the *apoplexie foudroyante* of the French,—the patient is struck down instantly, sometimes froths at the mouth, has a livid countenance, complete relaxation and immobility of the voluntary muscles and limbs, and unconscious evacuation of the urine and feces; and dies very shortly afterwards, either with or without stertor, or rattle of the respiration, with cold, livid extremities; cold perspiration, and sometimes a cadaverous cast of countenance.

7. B. In the more *active or sthenic* forms of attack,—the *Apoplexia fortis*; the *entonic* apoplexy of Dr. Goon; *A. exquisita* of various authors,—the patient is more or less suddenly seized with profound stupor, the eyes being either open or closed; the breathing deep, slow, sonorous, or stertorous; and the pulse slow, full, hard, or strong: sometimes irregular or unequal. In this state of the disease, the above are often the chief symptoms, no signs of paralysis being observed. But frequently the mouth is drawn to one side, the eyes are distorted, and one eyelid immovable, with relaxation, loss of sensation and of motion of a limb, or of one side of the body; the arm of the non-paralysed side being often closely applied either to the chest or to the genital organs. In this latter state of the disease, there is sometimes also some degree of paralysis of the urinary bladder, or of its sphincter, giving rise to *ischuria*, or *eneuresis*, or a combination of both. The patient generally lies on the paralysed side, which is relaxed, incapable of motion, and insensible to

the application of irritants; whilst the limbs of the opposite side are sometimes subject to spastic contractions.

8. C. In the more gradual seizures, or those of a less complete character,—the *atonic* apoplexy of Dr. Goon; the *Apoplexia imperfecta*, the *parapoplexia* of various writers,—the patient, after experiencing some of the premonitory symptoms, is seized with alarming vertigo, leipothymia, or feeling of faintness; sickness at stomach and vomiting; disturbance of the senses, particularly of the sense of sight; loss of memory; partial loss of sense, consciousness, speech, and voluntary motion; weak, irregular, and sometimes quick pulse, with more or less of sopor.

9. Besides the foregoing forms of apoplexy,—which differ merely in respect of the state of the constitutional powers, the severity of attack, and the grouping of the symptoms, and not as to the organic lesions which occasion them,—other distinctions offer themselves, which are still more deserving of attention, as generally having a more intimate relation to the changes which are going on within the head, than the degrees of severity of seizure merely. Viewing, therefore, the premonitory symptoms as common to all its varieties, I shall divide the disease according to the form, manner, and complication of the attack, and consider, briefly,—1st, The sudden form of apoplectic seizure, in its simple state, and unassociated with paralysis; 2d, The gradually increasing, or ingravescent attack; 3d, These states of seizure complicated with paralysis; and 4th, that form which commences with paralysis, and after an indefinite period passes into complete apoplexy.

10. iii. SIMPLE AND PRIMARY APOPLEXY. A. *Description.* In this variety of the disease the patient falls down deprived of sense, consciousness and voluntary motion, is like a person in a very deep sleep, with his face much flushed, tumid, and occasionally livid; his breathing slow, deep, and stertorous; his pulse full, natural in frequency, or slower than usual. Sometimes slight convulsions of the limbs, or contractions of the muscles occur, or contractions of the muscles of one side, and relaxation of those of the other. The attack, in rarer instances, is either ushered in or accompanied with general convulsions, passing into complete apoplexy, or profound coma. The patient may continue in this state of profound stupor for several days; or he may recover after some hours, or even minutes, when judicious assistance has been instantly procured.

11. B. This form of the disease *terminates*, 1st, in perfect recovery,—often in the course of a few hours,—but rarely when the attack has continued longer than one or two days. I have, however, seen cases of perfect recovery in comparatively young or robust subjects, after the apoplectic state had been of several days' duration. 2d, In death, which may take place in the course of a very few hours, or after some days, but most commonly from the first to the fourth day.

12. C. The *appearances* which this class of cases present on dissection may be arranged into—1st, Those which are insufficient to account for the symptoms, or their termination in death; 2d, Those which proceed from intense injection and congestion of the membranes of the brain, and of the cerebral structures; 3d, Those which are accompanied with an effusion of serum, or engorgement

tinues, the capillaries are soon afterwards injected and dilated; and, in proportion as they enlarge from the distending power to which they are more immediately subject, the veins are compressed, owing to the physical condition of the brain, more or less emptied, and admit of the greater dilatation of the capillaries, some one or more of which may be even ruptured from the increased action and distension.

118. *k.* In cases accompanied with *hæmorrhage*, and consequent laceration of the cerebral structure, the deprivation of function may be as much an effect of suppression of the vital influence of the organ, owing to the shock produced by the injury, as of pressure upon the veins, and consequent injection of the arterial capillaries. In cases of this description, the state described above (§ 112. *d.*) may exist, and be followed by hæmorrhage and laceration of the part in which it occurs, producing the abolition of the cerebral function, great vital depression, sickness, and other signs of dangerous injury sustained by a vital organ. The pressure occasioned by the hæmorrhage will be followed by obstructed circulation, and, under favourable circumstances, by increased action of the arteries and heart to overcome it.

119. *l.* In apoplexy presenting on dissection *congestion* and serous effusion, these states may be often considered rather in the light of *post mortem* changes than the pathological states which had existed previously to death; it may even be presumed that the distension and congestion of the capillaries, chiefly the arterial capillaries of the organ, had overpowered its functions; and that, as in other parts, when the injection of the blood into them no longer is continued, and the distending cause has ceased to exist, they have gradually discharged their contents into the veins, which now had space given them for dilatation, owing to the emptying of the capillaries; and thus the blood has passed into the veins soon after death.

120. *m.* Hæmorrhage in the brain may result from the following states:—*a.* Exhausted vital energy of the ganglial organic nerves supplying the vessels and organ favouring their distension and rupture: *β.* Diseased state of the coats of the vessels themselves: *γ.* Organic change of the cerebral structure, extending to, or influencing the state of, the vessels ramified in it: *δ.* Increased impetus of blood from augmented action of the heart and larger arteries, combined with either of the other states: *ε.* Impeded return of the blood from the head, similarly associated.

121. *n.* The vital energy of the organ, resulting chiefly from the mutual influence of the ganglial and vascular systems, may be so far affected as to occasion the attack with all the organic changes observed in fatal cases; and sometimes in such a manner as to constitute the disease, even without these changes having taken place; although they are most frequently produced, thereby heightening the primary lesion.

122. *o.* As corollaries from the foregoing, I infer that apoplexy often originates in exhausted or suppressed influence of the ganglial apparatus of the encephalon, with a congested state of its arterial capillaries, or impaired condition of their circulating functions, and still more frequently in extravasation of blood, either or all of which *changes must necessarily exist to the extent of*

suppressing the functions of the organ; and that, as apoplexy does not uniformly depend upon the same pathological state of the nervous influence and circulation of the brain, particularly in respect of the kind or degree of vital depression and vascular reaction, a due regard ought therefore to be had to the nature of the change in each case, as far as it may be ascertained, and a treatment strictly appropriated to it adopted.

123. VI. TREATMENT. — The treatment of apoplexy has long furnished subjects for discussion, not only as respects the more subordinate means of cure, but also as regards the most energetic measures and the intentions with which they should be employed. This is evidently owing to the difference which has been long acknowledged to exist in the pathological states constituting the disease, but which has recently been questioned. Without recurring to the changes so fully described above, I may remark, that a person is seized with apoplexy, and, instead of being blooded, is treated with stimulants and restoratives, and yet he recovers without paralysis having supervened. Another person is blooded largely, and he recovers. A third is treated in a similar manner, and he becomes hemiplegic in the course of the attack; and a fourth is also blooded, and he dies. Now these are very common occurrences, and point to very important considerations, which I will pursue a little further. A thin, spare, and debilitated man staggers as he walks, and falls down in the street, with pale countenance, feeble pulse, and laborious or slightly stertorous breathing. He is blooded by the nearest medical man almost immediately, and recovers. A large man, of a full habit and lax fibre, suddenly becomes apoplectic, and is instantly treated with stimulants, and volatile substances held to the nostrils, and his consciousness and voluntary motion are restored in a few minutes. One practitioner of large experience states, that he never draws blood from a patient in apoplexy, excepting under peculiar circumstances, and avers that he is more successful in his treatment than those who do. Another considers that when one full blood-letting fails of giving relief, no benefit will be derived from pushing it further, but much risk of giving rise to paralysis. A third physician equally eminent and experienced, confides in blood-letting almost solely, and carries it often to a great amount; and a fourth whilst he discards depletion, trusts to stimulants chiefly.

124. But if we examine into their success, we shall find, perhaps, that some difference as to degree may exist; and that, whilst many patients seem benefited, others experience no relief, if they be not even actually injured, by the kind of practice thus exclusively adopted. There is, however, one part of the treatment which is more or less adopted by all: this is the use of purgatives; which, when judiciously administered, are the most generally applicable and beneficial of all the means usually advised. Were it possible to ascertain during life the exact pathological condition obtaining in the various cases of apoplexy, and to convey a correct description of the signs by which each may be known, then the basis for a rational method of cure could be firmly laid: but the skilful practitioner is guided in the treatment he adopts by considerations, circumstances, and appearances, which scarcely admit of de-

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being kept up by the enlargement of collateral branches, the obstructed part is deprived of its functions, and subsequently undergoes those changes which all vascular or other canals experience when they no longer are pervious to the fluids which usually circulate through them,—they have the fibrinous coagula, which have been formed in their cavities, and the lymph effused between their coats, absorbed, and their coats become condensed into ligamentous chords.

56. *c.* The third species has been met with in the aorta by Dr. GOODISON (*Dub. Hosp. Rep.* vol. ii. p. 193.), and M. VELPEAU (*Rév. Méd.* 1825, t. iii. p. 326.) In Dr. GOODISON's case, an osseous deposit surrounded the canal of the vessel, which was completely filled at this part with a dense fleshy and fibrinous mass, resembling the structure of the heart. A similar obliteration also existed in the iliac arteries. In M. VELPEAU's case, the obliteration was owing to the formation of a scirrhus or carcinomatous tumour in the vessel, resembling similar tumours developed in different parts of the body. Obliteration by polypous or other growths, by fibrinous coagula and coagulable lymph, by ossific deposits, &c. are also found in large arterial branches, especially in those supplying the lower extremities. The obliteration of the arteries by ossification is one of the principal causes of the gangrene of aged persons. When a considerable artery, or even the aorta, becomes either much obstructed, or entirely obliterated, in any of the above ways, the circulation is generally carried on by enlarged collateral vessels.

57. *d.* The fourth species has been observed in several large arterial trunks. Dr. MONRO's case of obliteration of the aorta may be partly ascribed to this cause; the coats of the vessel, although entire, being dilated below the constricted part.

58. *D. ALBUMINOUS AND PURULENT MATTER.*—M. GENDRIN (*Hist. Anat. des Inflam.* t. ii. p. 9.) has clearly proved, by his experiments, that, when an artery is artificially irritated, its parietes soon become injected, swollen, softened, and infiltrated by a serous fluid; its internal surface is coated by an *albuminous exudation*, and collections of pus form, either in the interior of the vessel, or between its coats. He has, moreover, demonstrated that, if the artery continues full of blood during the experiment, this fluid is coagulated, and altered in a variety of ways by the morbid secretion poured into it from the internal surface of the inflamed vessel. Similar appearances have been observed from disease, particularly in the aorta and large arterial trunks, where they are most obvious. Mr. HODSON and M. BOUILLAUD found the internal surface of the aorta lined with a perfect *false membrane*; and when this was removed, the surface of the vessel was of a bright red colour. M. ANDRAL has observed the internal membrane of the artery raised by small abscesses, sometimes as large as the size of a nut, situated between the internal and middle coats. It is probably to the bursting of those into the vessel that ulceration of the internal tunics is owing. Pus is also sometimes found in the interior of arteries, either unmixed with the blood, or mixed with it and altering its appearance.

59. *F. ATHEROMATOUS* matter is frequently found between the inner and middle coats of arteries. It was first noticed in this situation by

MONRO and HALLER. It is generally of the consistence of suet, of a cheesy opaque appearance, is greasy to the touch, with minute gritty particles thinly scattered through it. In some cases it resembles more nearly a semi-concrete pus, and seems to result from the changes which pus may have undergone subsequently to its secretion. In other cases the atheromatous matter abounds in gritty particles, which occasionally even exceed the suety part; and the deposition thus passes into the form of a calcareous concretion. It is extremely probable that these varieties of morbid formation are connected with chronic inflammatory action of the coats of the vessel.

60. A variety of the atheromatous matter has been described by MORAGNI, SCARPA, STENIZEL, and CRAIGIE, under the denomination of *steatomatous* deposition. The name, however, as Dr. CRAIGIE has remarked, is not well chosen, inasmuch as this formation is not adipose, but a firm cheesy or waxy matter, of a yellowish or fawn colour. It seems merely a more concrete variety of the foregoing, and differing from it chiefly in the absence of gritty particles. It is more frequently found at the bifurcations of arteries, but it is not limited to those situations; and is generally deposited between the inner and middle coats. When the quantity of this matter is considerable, it encroaches on the calibre of the vessel. This substance is met with either alone, or with patches of calcareous deposit. It probably derives its origin from a similar source to the atheromatous matter; and, according to SCARPA, always terminates in ulceration; but this is not invariably the case, as it has been observed, particularly when unattended with calcareous formations, distending the coats of the vessel to a great extent without any ulceration. This change, however, takes place very generally, either when the deposition of this matter is considerable, or when associated with calcareous formations. When ulceration takes place, the coats of the vessel are soon destroyed to a greater or less extent, and rupture follows; taking place, as shown by Mr. HODSON, in a transverse direction to the axis of the vessel, and giving rise to extensive or fatal hæmorrhage, or to circumscribed or diffused aneurism, according to the situation of the aperture in the vessel.

61. *F. CALCAREOUS or osseous concretions* are the most frequent morbid appearances presented by arteries. These concretions, however, differ from healthy bone chiefly in wanting the fibrous structure, in not being necessarily deposited in a cartilaginous matrix, in consisting of a larger proportion of phosphate of lime, and less animal matter, and in presenting an irregular, homogeneous, and unorganised appearance. BICHAT and BAILLIE considered that the larger proportion of persons above sixty years of age have some part of the arterial system affected by these formations. This change is very seldom observed in early life. YOUNG found it, however, in an infant; WILSON in a young child; and ANDRAL in the aorta of a child of eight years of age. M. ANDRAL has met with ossific laminæ in the aorta, in five or six persons of from eighteen to twenty-four years of age: and an extensive ossification of the superior mesenteric artery of a person not quite thirty. This species of formation always is seated

occurred to him. LETTSOM recommended sulphur; and I believe that its good effects are very considerable. In a case which lately came before me, of violent cephalalgia, with muscular tremors, &c., after a severe mercurial course, large doses of sulphur merely, given every night in treacle, produced a cure in a few days. Mr. PEARSON chiefly relied upon exposure to a dry and open air. SEMENTINI states, that he obtained uniform advantage from the internal use of the nitrate of silver, beginning with an eighth of a grain, and gradually increasing the dose to three grains in the day. I have lately employed the *tincture of iodine* in two cases of this affection with success; and in one instance I prescribed *strychnine*, but lost sight of the patient before its effects were apparent. Mr. EARLE (*Lond. Med. Gaz.* vol. xi. p. 31.) gave five grains of the extract of conium, three times a day, with benefit.

26. c. It is obvious that it is of importance to be in the possession of plans to prevent the injurious effects of mercury on those employed in the arts in which it is used. These are sufficiently simple, and consist chiefly of common attention to cleanliness, and avoiding the fumes of the mineral during the various parts of the processes of gilding. Workmen should avoid touching the amalgams that are used with the naked hand; and ought to make frequent ablutions, particularly before taking a meal. During the process of volatilising the mercury by heat, the utmost caution should be exercised in performing the operation with a stove in which the current of air is very brisk, so that the fumes may be carried fully up the flue. In most of the manufactories in this country, the stoves are now sufficiently well constructed for this purpose, the carelessness of the artisan being the chief cause of danger from his occupation. M. JUSSIEU states, that the free workmen in the large quicksilver mines at Almaden, who took care to change their whole dress, and attended to cleanliness, were but little affected by their occupation; but that the slaves, who could not afford a change of raiment, took their meals in the mines generally without ablutions, were subject to swellings of the parotids, aphthous sore throat, salivation, eruptions, and tremors. (*Mém. de l'Acad. des Sciences*, 1719, p. 474.)

27. B. Lead.—a. Injurious effects from lead, in the various states in which it is used, are very frequent and often fatal. Its oxides may be carried off in a state of vapour, dissolved in volatile substances, as by turpentine in painting, and thus be inhaled into the lungs, and act most injuriously on the frame. It may also pass into the alimentary canal in various ways, or it may be absorbed from the skin, particularly of the hands, where it will both act locally, and be carried into the system, and produce its effects as when introduced by the two former channels. These effects are chiefly lead colic and paralysis. The workmen employed in lead mines, those who are engaged in procuring it from its ores, who cast it or manufacture its various preparations, and who use them in the different arts, as plumbers, glaziers, painters in oils or water-colours, colour-grinders, type-founders, printers, are the most liable to be effected by lead; but all classes, under certain circumstances, may also experience injurious effects from it. The deleterious nature of this mineral is cer-

tainly very great; but the fatal results are surely not one in three annually, as stated by Sir JOHN SINCLAIR.

28. b. M. MERAT has furnished some very interesting information respecting the frequency of *colica pictonum* in the various classes of artisans who come in contact with any of the different preparations of lead. It is derived from the list, kept at the hospital La Charité, in Paris, in the years 1776 and 1811. The total number in both years were 279. Of these 241 were artisans, whose trades exposed them to the poison of lead, viz. 148 painters, 28 plumbers, 16 potters, 15 porcelain makers, 12 lapidaries, 9 colour-grinders, 3 glass-blowers, 2 glaziers, 2 toymen, 2 shoemakers, 1 printer, 1 lead miner, 1 shot manufacturer. Of the remainder, 17 belonged to trades exposed to copper. Of the 279 cases, 24 were under twenty years of age, these being chiefly painter boys, not above fifteen; 113 were between nineteen and thirty; 66 between twenty-nine and forty; 38 between thirty-nine and fifty; 28 between forty-nine and sixty; and 10 older than sixty. Among the 279 cases, 15 died, or 5.4 per cent. (See the article COLIC, FROM LEAD.)

29. c. The measures of prevention from the action of the preparations of lead differ in no respect from those which have been stated in relation to mercury (§ 26.) They chiefly consist of strict attention to personal cleanliness. The instructions given by M. MERAT are very complete, but are too particular to be followed by workmen. He recommends that the working clothes should be made of strong compact linen, be changed and washed once or twice a week, and be worn as little as possible out of the workshop; a light impervious cap ought always to be worn on the head. The artisan should never take his meals in the workshop, or without strict ablution of the hands, mouth, and face; and he ought to breakfast before leaving his home.

30. Derangements of the digestive organs ought to be watched with care. If colicky symptoms occur, he should leave off work, and take an aperient. He ought always to guard against constipation. The diet of those exposed to be affected by the preparations of lead is of consequence. It should be light and digestible; and poor acid drinks ought to be avoided, particularly cider, as themselves often containing lead. Various articles of diet have been recommended as calculated to impede the hurtful action of lead on the frame. HOFFMANN mentions brandy—a somewhat dangerous recommendation. Fat food has been accounted preservative. DE HAEN states, that the workers in a lead mine in Styria were much affected by a colic and palsy, but, by being told by a quack doctor to eat a good deal of fat, particularly at breakfast, they were exempt from these diseases for three years (*Rat. Med.* p. i. ch. ix.) Similar facts respecting the good effects of fat meat, as a preventative of the effects of lead, are recorded by Sir GEORGE BAKER (*Trans. of Lond. Coll. of Phys.* vol. ii. p. 457.) and Mr. WILSON (*Edin. Phys. and Lit. Essays*, I. p. 521.) Those who work at furnaces in which lead is smelted, fused, or oxydised, should be protected by a strong draught through them. Mr. BRAID, of the extensive mines at Leadhills, informed Professor CHRISTISON (see his most valuable work on Poisons, &c. p. 506.), that wherever

tion suggests itself, viz. can this augmented action of the lungs be owing solely to the state of this organ, or is it associated with, or partly depending upon, increased activity of the respiratory muscles, particularly the diaphragm? M. LAENNEC states that it cannot be produced at will by a full inspiration; and, therefore, infers that this state of the lungs is a primary condition of them, and not depending on increased inspiratory efforts.

32. From this consideration I am led to infer that, although the vital expansile action of the lungs may be increased in this variety of asthma, it is accomplished with, and much assisted by, augmented activity of the diaphragm, which performs its office more promptly and completely in this variety of asthma than in any other; that instead of the disease being characterised by spasm of the smaller ramifications of the bronchi and air-cells, as in the second variety of asthma, the air penetrates more fully into them than usual; and that, if any spasm exists, it is limited to the trachea and large bronchial tubes; the exalted state of expansion of the lungs, and of function of the diaphragm, being an effort to counteract this morbid condition of the large tubes, and to supply the wants of the system by a more forcible inspiration; the increased rapidity with which the air is thereby made to pass through the strictured canals making more than amends for the diminished calibre of the passage. This form of the disease is frequently *symptomatic* of nervous affections, particularly of hysteria, when the globus hystericus affects the state of the trachea, and of various diseases, in which the blood is imperfectly changed in its circulation through the lungs. But when thus symptomatic, it is often slight and evanescent.

33. 2d, *Spasmodic Asthma*. SYN. Periodic Asthma. Convulsive Asthma, *Willis*, *Baglivi*, *Boerhaave*. Asthma Siccum, *Musgrave*. Occult dry Asthma, *Etmuller*. Spasmodic Asthma, *Laennec*. Dry Asthma, *Good*. — CHAR. Paroxysms sudden, violent, and of short duration, attended with hard spasmodic constriction in the chest; slight, dry, and difficult cough, and with a scanty expectoration, occurring only towards their close.

34. I stated that the vital expansive action of the lungs was increased in the foregoing variety. In this the ramifications of the air-tubes, and perhaps the air-cells themselves, seem to be unnaturally constricted. The respiration, when examined by the stethoscope, or by the ear merely, is heard either very imperfectly even on the most forcible respiration, or to a small extent only, or its sound may be but little impaired. The chest, during the paroxysm, sounds ill on percussion. These phenomena indicate that there is an imperfect entrance of the air into the air-cells. M. LAENNEC states, that if the patient after holding his breath nearly as long as he can, breathes quietly, the spasm will often be overcome as it were by surprise, and the entry of the air into the cells will be heard in a clear or even puerile sound. This, and various other circumstances, independently of the proof furnished by the structure of the air-tubes, indicate that the obstruction to the entrance of air into the cells is owing to spasm of the muscular fibres.

35. Dr. WILLIAMS believes that spasmodic

asthma may be partial, affecting one lung only, or one more than the other; but this is very seldom the case, unless when it is occasioned by, or complicated with, dry catarrh, which is sometimes partial; or when the spasmodic constriction is excited by a collection of a pituitous fluid in some of the bronchi, — a complication of not infrequent occurrence, but falling more strictly under the next form of the disease. Although the paroxysms of the primarily spasmodic asthma are sudden, and generally of short duration, yet the disease is often of long continuance, and may, to a certain extent, become habitual, as shown by Dr. BREX and others.

36. During the spasm, the lungs seem, from an attentive examination of the thorax, somewhat drawn together, owing to the constriction of the air-tubes; and the parietes of the chest, being necessarily pressed inwards at the same time, generally yield a less clear sound on percussion. The scrobiculis cordis is also drawn inwards and upwards, indicating the manner in which the diaphragm is affected during the paroxysm. This phenomenon, which was first pointed out by SCHEIDMANTEL (*Fränkische Beiträge*, No. 5.), arises either from the diaphragm being prevented from contracting to its full extent by the spastic constriction of the air-vessels, or from a temporary paralysis of this muscle. That the latter state should take place, and be followed in a short space of time by a perfect restoration of action, and that repeated seizures of this description should be always succeeded by a similarly rapid return to the healthy state, cannot be admitted by any person who takes an intimate and comprehensive view of the operation of the animal economy in health and disease. That retraction of the epigastrium, and even of the hypochondria, is owing to imperfect descent of the diaphragm from constriction of the air-cells, seems proved by the circumstance, that the pleural cavity is perfectly closed, and forms nearly a vacuum, and consequently the capacity of the thorax cannot be enlarged by the action either of the diaphragm or of the other respiratory muscles, without the expansion of the lungs. But this organ is only imperfectly expanded, owing to the spasm of its air-vessels; consequently the diaphragm either cannot assume its usual place, or does so imperfectly, notwithstanding its efforts to accomplish this end; and the parietes of the thorax are every where pressed inwards, following the retracted state of the lungs themselves, and are only partially dilated after the most energetic action of the respiratory muscles, which at last overcomes the spasm of the air-tubes, as the want of respiration throws the former into spasmodic action, and tends to relax the spastic state of the latter.

37. This condition of the air-vessels, and the antagonising action of the respiratory muscles during the paroxysm, have a necessary tendency to form a vacuum in the thoracic cavity; but this can take place to a very small extent only, as the action of the respiratory muscles is insufficient to overcome both the pressure of the atmosphere surrounding the chest, and the spastic structure of the air-tubes, as long as this stricture continues in full force. The consequence, however, of this antagonising action and tendency to form a vacuum is, that a larger quantity of blood is

from which it is imperfectly expelled. From this circumstance the lungs are often kept in a state of inordinate dilatation, and the respiratory muscles excited to convulsive actions, occasioning dilatation or rupture of the air-cells, and consequent emphysema of the lungs. In the more advanced stages of the disease, in old and debilitated subjects, this struggle to dilate the thorax still further, proceeding from the wants of the system for respiration, and to expel the air from the lungs through the obstacles placed in its way, generally terminates unfavourably to the latter part of the respiratory actions; consequently expectoration is impeded or suppressed, and life is terminated, with the air-tubes and cells, and even the substance of the lungs, loaded and infiltrated with mucus, air, and serum. It is in this state that active stimulants and emetics, by rousing the energies of the frame, and by exciting the expiratory efforts during the process of vomiting, prove so frequently beneficial.

44. This form of asthma may be partial, affecting one lung only, or one more than another; but it is more commonly general; and in some constitutions, particularly in aged persons, and when it has supervened to repeated attacks of catarrh, the quantity of viscid mucus expectorated is very great.

45. Its *anatomical characters* are, slight swelling, or thickening, and softening of, the mucous membrane, with a slight appearance of redness in parts, and with marked congestion, and purplish tint of portions of this surface in the more severe or protracted cases. Sometimes these lesions are accompanied with slight œdema of the membrane, and the development of miliary tubercles in the lungs.

46. As the majority of cases of this disease is characterised from the commencement by copious expectoration, it becomes a question how far it deserves to be considered as a variety of asthma; but taking all its phenomena into consideration, particularly the spasm of the air-passages, and convulsive action of the respiratory muscles, as well as the circumstance of it having been usually considered as a species of asthma, and the difficulty of arranging it otherwise, I was unwilling either to assign it a different place, or to make it a distinct disease, to which it scarcely can lay claim. M. LAENNEC has placed it amongst catarrhal inflammatory affections of the bronchi: but I conceive that it is seldom inflammatory either in its origin or progress; and that, although occasionally commencing in, and always aggravated by, catarrh, it is not necessarily a catarrhal disease. Besides, inflammations of the bronchi and catarrhs are not identical affections, although the latter frequently pass into the former.

47. But, besides these considerations, many of the phenomena essentially characteristic of asthma always attend it to a greater or less extent. Upon an attentive examination, however, of the chest of a person afflicted with this affection, by auscultation and percussion, these phenomena are found to vary, in different cases, or even in the same case, at different periods of the attack; yet they are essentially the same as those which mark the preceding varieties, although not so evident to the senses as in them, inasmuch as they are obscured by a more prominent symptom — the copious mucous secretion and expectoration. Sometimes it

is manifest that certain parts of the air-tubes are differently, or even oppositely, affected at different periods of the attack. When the viscid mucous secretion proceeds from, and is still present in, the smaller ramifications of the air-vessels, this condition, together with some degree of spastic constriction of their circular fibres, either in a part only, or more or less throughout the organ, occasions many of the symptoms which characterise the *second* or spasmodic variety of the disease. But in proportion as the secretion rises to the larger air-tubes, and leaves the smaller ramifications clear; or when the mucous secretion proceeds chiefly from the former parts, and excites, or is accompanied with, spasms of these canals, but not to the extent of preventing the passage of air into the parts of the lungs which they supply; these parts generally expand freely, owing to the vital activity of the organ, the wants of the system for the changes effected on the blood by respiration, and the active contraction of the inspiratory muscles during the convulsive efforts of the paroxysm. Hence the part of the lungs thus affected generally furnish the puerile respiration, and a clear sound on percussion, with a full and prompt performance of the inspiratory actions, — phenomena characteristic of the *first* or nervous form of asthma.

48. III. DIAGNOSIS. — From the foregoing account of the symptoms and forms of asthma, it will appear obvious that the distinction of it from every other disease cannot be difficult, particularly if we carefully bring auscultation and percussion to our assistance. The sudden attack of the paroxysms, the short period of their duration, the violence of their symptoms, their returning after intervals of ease and of tolerable health, are sufficient to characterise the disease. It is only when asthma is complicated with, or has induced, other diseases — as chronic or acute bronchitis, pneumonia, tubercular phthisis, organic changes of the heart and large vessels, or effusions of fluid within the thorax — that difficulty can arise in determining the exact state of parts; and here we have it in our power to resort to auscultation and percussion, which, if this disease be simple and uncomplicated, will furnish us with no very unnatural sound, at least with none which will exist with any permanency in any particular part of the chest; and if it be complicated, the nature and the extent of the organic changes will be ascertained by these means, as pointed out under their respective heads.

49. A. *Spasmodic affections of the larynx* may be mistaken for asthma; but they may readily be distinguished from it by the sound occasioned by the passage of air through the narrowed passage, which is very different from the wheezing sound of the asthmatic respiration. Besides, in all the affections of the glottis, the patient readily points to it as the seat of his sufferings. The patient also betrays much more alarm of impending suffocation; whereas in asthma he is seldom apprehensive of the result, however severe the attack may be.

50. B. *Severe cases of acute bronchitis*, owing to the viscid and copious expectoration accumulated in the bronchi and trachea, and to the spasm excited in these parts and in the glottis during its expulsion, are often accompanied with fits of

24. *c. Pectoriloquy.*—The existence, in disease, of vocal resonance in any part of the chest, to the extent of laryngophony, has been termed *pectoriloquy* by LAENNEC. It may be either *imperfect* or *perfect*. It is the result of a morbid cavity, formed in the substance of the lungs, and communicating with the bronchi; to which cavity the sound of the voice, or vibrations of the air in the tubes, is propagated. When the stethoscope is applied to a part of the chest, under which one of these cavities is situated, the words which the patient utters seem to proceed from that spot; and hence the term *pectoriloquy*. "The distinction between perfect and imperfect pectoriloquy is, as in the case of natural resonance, whether the voice seems to traverse the tube, or remain at the end; and the physical difference producing the two modifications consists in the size and situation of the cavity. The most perfect pectoriloquy is produced in cavities of moderate size, which are situated near the surface of the lung, and freely communicate with a large bronchial tube. If the cavity be deep-seated, or if its communication with the bronchi be imperfect, the resonance of the voice will not amount to perfect pectoriloquy. True pectoriloquy produced by a cavity, is generally abruptly circumscribed, so that its limits can be distinctly traced."—(WILLIAMS'S *Rational Exposition*, &c. p. 43.). ANDRAL appears to be correct in considering perfect pectoriloquy as not common, and that the imperfect state of this sound, or bronchophony, is very frequently mistaken for it. When present in any part of the chest where there is naturally no bronchial resonance, it may be considered as a certain indication of the existence of a morbid cavity, generally tubercular; and when heard in situations of natural bronchial resonance, although more doubtful, yet if it be perfect, distinctly circumscribed, and heard on one side only, the same conclusion must be come to. It may be further added, that an empty state of the cavity, its rounded and regular shape, and natural sharpness of the voice, particularly in women and children, tend to render pectoriloquy perfect.

25. III. AUSCULTATION OF THE HEART.—A. *In its healthy state.* I have always viewed LAENNEC'S explanation of the sounds proceeding from the heart's contractions as the most defective part of the exposition of his system; and a similar opinion seems to have been entertained by Mr. TURNER, Dr. WILLIAMS, and several others. The observations of Mr. TURNER, and of Drs. STOKES and CORRIGAN, first shook the stability of the views of LAENNEC on this subject; and the recently published researches of Dr. HOPE have almost altogether overthrown them. As I consider the exposition of the actions and sounds of the heart, given in Dr. HOPE'S work, to be the most accurate, I shall follow it on this occasion.

26. 1st. *Of the Contractions of the Heart in the order of their occurrence, &c.*—The first motion of the heart following the interval of repose, is the systole of the auricle. It is a very brief and slight contractile movement, most considerable in the auricular appendix, and propagated toward the ventricle, in the systole of which it terminates, by a nearly continuous action. The systole of the ventricle commences suddenly, and diminishes considerably the volume of the organ. "Synchronous with the systole are the first sound, the impulse of the apex against the ribs, and the

pulse of the vessels near the heart;" the pulse at the radial arteries following at a barely appreciable interval. The diastole of the ventricles follows their systole; and these compartments return, by an instantaneous expansive movement, to the same state as during the previous interval of repose. The diastole is accompanied with the second sound, with a rush of blood from the auricle, by a contractile motion of this cavity most observable at its sinus, and by a retrocession of the apex of the heart from the ribs. "Next succeeds the interval of repose, during which the ventricles remain at rest in a state of fulness, though not of distension, through the whole period intervening between the second and the first sounds; but the auricle remains at rest during the first portion only of that period, the remainder being occupied by its next contraction, with which recommences the series of actions described."—(HOPE on the Dis. of the Heart, &c. p. 40.)

27. The *rhythm* of the heart, or the duration of the several parts of this series of actions, constituting what may be called a beat, is the same as described by LAENNEC:—1st, The ventricular systole occupies half the time of a whole beat; 2d, The ventricular diastole occupies a fourth, or at most a third; 3d, The interval of ventricular repose occupies a fourth, or rather less, during the latter half of which the auricular systole takes place.

28. 2d. *Causes and mechanism of the motion.*—The auricles, being always in a state of fulness, arrive, during the first half of the period of repose of the ventricles, at a state of distension, on which they react and propel a small additional quantity of blood into the full but not yet distended ventricles, in order to bring them to this state, and to cause them to react, and thus expel a greater or less portion of their contents. During the expulsion of the contents of the ventricles, Dr. HOPE considers that the apex of the heart is tilted upwards and forwards, and occasions the impulse against the ribs, in consequence of the retraction of the ventricles upon their base, and on the auricles, which, being in a state of extreme distension, serve as a fulcrum beneath them. The *diastole* of the ventricles appears to be occasioned, 1st, by the relaxation of the principal part of their muscular structure, assisted by an elastic property; 2d, by the distension of the auricles, which has arrived at its height, and brings into action certain layers of ventricular fibres having a powerful influence in distending these cavities; 3d, by the width of the auriculo-ventricular opening, which allows the blood to rush instantaneously, and with facility, from the auricles into the ventricles. The blood expelled from the former cavities into the latter being instantly replaced from the *venæ cavæ*, distension of the auricles immediately recurs, and the same series of actions is continued.

29. 3d. *Causes of the sounds.*—There can be no doubt that the sounds of the heart's actions are not produced by the mere contraction of its muscular structure. To what other cause can we impute them? I conceive that they can only be referred to the action of the parietes of the cavities on the fluid circulating through them, and to the motions of this fluid. According to this view, which has been very diligently investi-

13. **DEFIN.** *Greater fulness of the vascular system than is compatible with the continuance of health; or repletion of this system.*

14. The importance of attending to the varying states of the circulating system, in respect of both *exuberance* and *deficiency* of the fluid contained in it, has been acknowledged since the time of GALEN. After the doctrine of nervous influence had superseded the humoral pathology, the state of the blood in disease experienced a more general neglect, than the part actually performed by this fluid in the causation and perpetuation of morbid actions ought to have procured for it. Yet have there always been a succession of able observers and writers, who have never lost sight of the influence of the *quantity* as well as *quality* of the blood in producing, as well as in modifying, disease; and more recently the subject has deservedly received an increased and an increasing attention. *Plethora* is the opposite of *anemia*: both may be, to a certain extent, compatible with health; but both predispose more or less to disorder, and, beyond certain limits, constitute distinct and opposite states of disease.

15. i. **GENERAL PLETHORA.** — *A. States of.* — GALEN, BAILLOU, FERNEL, RIVIÈRE, and others, considered plethora to be of two kinds; to which subsequent writers added two more. As these distinctions are still, in several respects, founded in truth, notwithstanding the neglect into which they had long fallen, I will here briefly notice them. 1st, True or absolute plethora — *plethora ad rem*; 2d, Apparent, or false plethora — *plethora ad columnen*; 3d, Plethora relative to space — *plethora ad spatium*; 4th, Plethora in relation to vital power — *plethora ad vires*. It will be observed that the first and second of these, the species recognised by the earliest writers, are still upon the whole the most important. In the *first*, the blood is permanently increased beyond the wants of the system. In the *second*, plethora is merely a passing occurrence, arising from temporary causes, as the general turgescence occasioned by sudden or high ranges of temperature, &c. In the *third*, the blood may not be increased, but its relative quantity may be too great, as is observed after amputations of one or two limbs. In the *fourth*, the quantity may not be too great, if this fluid were actuated by a healthy state of the vital energy: but it may be excessive in respect of the influence by which it is circulated in all parts of the body. Now, those distinctions are actually founded in nature; and although they may all be resolved into one pathological proposition, viz. greater repletion of the vascular system than the wants and conditions of the economy require, still they must have become matters of experience to every one whose range of observation has been such as entitle his opinions to respect. I shall merely remark upon such of them as admit of dispute.

16. False plethora is very generally observed to occur in persons suddenly exposed to elevations of temperature, and depends more upon the effect of heat in exciting the vital turgescence of the capillary vessels, whereby a craving for fluid is created, and a larger quantity is absorbed, than upon the expansion of the fluids themselves, owing to the increase of temperature. A state of false plethora is very frequently occasioned, — and is often productive of more serious consequences

than have generally been imputed to it, — by *ingurgitation* and increased temperature conjoined; and it should not be overlooked, that these combined influences not infrequently affect those who are already permanently plethoric. This will be more forcibly and truly shown by what must have fallen under the observation of many. A red faced, full veined, and robust looking person, of from forty to sixty, sits down to dinner with a good appetite. He eats three times as much as his body requires, and he excites the stomach to digest it by drinking stimulating fluids to six times the quantity that is necessary. All this, moreover, is done in a close and overheated apartment. The vital turgescence and expansibility of the capillaries and veins are excited to the utmost; the whole surface is full and plump, and the extremities even swollen. Now, a person thus circumstanced, particularly from four to eight or more hours after such ingurgitation, actually has the quantity of his circulating fluids increased from one sixth to one third, at a moderate calculation: but the increase is generally soon diminished by the pulmonary exhalation; the urinary, the perspiratory, and intestinal secretions; which are all greatly augmented, and are thus the safety valves of the circulation. But how often, notwithstanding, do we observe the vessels at last yield before the mass which distends or overloads them, and apoplexy, and various other hæmorrhages and congestions, result; particularly when any one of these safety valves are obstructed or tardy in their action — when the nervous or vital influence is either depressed or much exhausted by the previous excitement, and the vessels are irritated, or their actions otherwise changed by the state of their contents.

17. That plethora is a not infrequent result of amputations cannot be disputed, although the privation of sufficient exercise, which is thereby occasioned, will partly account for the occurrence; at the same time we generally observe that the same quantity of food is taken, and the same quantity of blood is prepared for the body, when deprived of one fourth part of the structures requiring support, as was provided for its nourishment when it was in a state of integrity.

18. That plethora may exist in conjunction with deficient vital or nervous power, and that, although the quantity of blood in the system may not exceed that of health, and yet be too great for this power to control, cannot be doubted. We are constantly observing such pathological conditions, both at the commencement and in the progress of disease; and frequently remark their influence in its advanced states and terminations. (See article CONGESTION.)

19. *B. The causes* of plethora are so manifest as scarcely to require enumeration. They may operate either singly or in conjunction. They consist, 1st, Of the introduction into the vascular system of a greater quantity of the nutritious elements than is necessary to the support of the organisation; and, 2d, Of the retention in the blood of those parts which are usually removed by the secreting and excreting organs. It must be evident that the former is owing to excess of nourishment and stimulating fluids; whilst the latter proceeds most commonly from insufficient exercise, suppressed natural secretions and excretions, or accustomed morbid discharges. How

passes rapidly into a state of lethargy and coma, which on numerous occasions I have seen mistaken for effusion of serum within the cranium, or hydrocephalus, particularly when it has been preceded by convulsions, as is often the case in children. In many such cases, either no effusion is found, or the effusion is to an extent insufficient to account for the comatose symptoms.

Under more favourable circumstances the reaction is gradually followed by returning health, or passes into a state of chronic exhaustion or *asthenia*, which is variously characterised. In some cases it is attended by somnolency, alternating with slight delirium, &c.: in others, by fits of dyspnoea, palpitations, frequent cough; hurried, laborious breathing; a flatulent, tympanitic state of the abdomen: in several, by pale, emaciated, or discoloured countenance and skin; amaurosis, nervous tremors, or jactitation; delirium, or *mania*: and in puerperal females by a form of *mania* which requires to be carefully distinguished, and which is particularly noticed under the article on *Puerperal Mania*. In addition to these functional disorders following reaction after large losses of blood, organic changes may supervene; such as effusion of serum and extravasation of blood upon the brain, effusion into the bronchi and air-cells, dropsical effusions in various parts, and flatulent distension of the stomach and bowels. When recovery takes place, the pulse always continues small and frequent for a long time, owing to the remarkable diminution of the fluid in the vessels.

61. C. *Of the insidious effects produced by small but often repeated losses of blood.* — Loss of blood occurring in this manner produces effects different from those now described. They generally as may be expected, advance slowly, and often exist either altogether, or a long time, without detection. They are extremely various, according to the age and constitution of the person. They most frequently occasion a pale, leucoplegmatic, and lax appearance of the countenance and surface; a very quick, weak, and irritable pulse; hurried, and oppressed respiration; frequent palpitations, and sense of sinking; *borborygmi*, and hysterical symptoms; flatulent distension of the colon, and colicky pains; swellings of the ankles, and dropsical effusions in other parts: in females, difficult and scanty menstruation, chlorosis, deviations of the spinal column, epileptic convulsions, pains in the loins, and various anomalous affections of a painful or spasmodic kind; tremors and irregular action of muscles; chorea; paralysis; dyspeptic disorders, with irregularity of the bowels; a disposition to syncope; amaurosis; and all the symptoms of *anæmia*, which indeed is the primary or real state of disease produced, and constitutes the chief change detected upon examination after death; together with serous effusion in some situations, and a pale bloodless state of the viscera, and of the heart itself.

62. II. *OF EXCESSIVE LOSS OF BLOOD IN THE COURSE OF VARIOUS DISEASES.* — There are two important considerations which should not be overlooked in practice; viz. that in many diseases, apparently attended with excitement, we shall meet with cases in which the actual quantity of blood in the body is much less than usual; and in various others, blood-letting will often not be

borne, although seemingly indicated, and although the quantity of blood in the frame be not lessened. In illustration of the former of these, I may state that many years ago I had an opportunity of remarking minutely the appearances on dissection of a man of middle age, and somewhat fat, who had complained of an acute and painful disease, obviously functional, for which he had been bled only twice on successive days, and on neither occasion to above thirty ounces; and yet the symptoms of excessive loss of blood appeared, from which he died in twenty-four hours after the second depletion. The most careful examination could detect no organic change, excepting the remarkably bloodless and pale state of all the viscera. Even the brain was less vascular than usual. That in various diseases, unattended by diminution of the circulating fluid, depletion will produce marked symptoms of depression and sinking, owing to the state of the vital power being insufficient to accommodate the vessels, by their tonic or vital contraction, to the reduced bulk of the blood, is well known, and has been fully discussed in the articles on *Adynamic Fevers*, *Erysipelas*, and *Puerperal Fevers*; in which, as well as in puerperal mania, and various other acute diseases, large vascular depletion is often most injurious.

63. A. *Of excessive loss of blood in diseases of excitement.* — The morbid effects of large depletions will necessarily vary with the nature of the disease in which they are employed. When carried too far, in cases of excitement, where the nervous or vital power is not depressed, and the blood itself rich or healthy, reaction generally follows each large depletion, and thus often exacerbates or brings back the disease for which it was employed, and which had been relieved by the primary effects of the evacuation. This is more remarkably the case in acute inflammations of internal viscera, particularly of the brain or its membranes. Thus, every observing practitioner must often have noticed, that a large depletion, when carried to deliquium, will have entirely removed the symptoms of acute inflammation when the patient has recovered consciousness; and that he expresses the utmost relief. But it generally happens that the inordinate depression — the very full syncope that is thought essential to the securing of advantage from the depletion — is followed by an equally excessive degree of vascular reaction, with which all the symptoms of inflammation return; and the general reaction is ascribed entirely, but erroneously, to the return of the inflammation, instead of the latter being imputed to the former, which has rekindled or exasperated it, when beginning to subside. The consequence is, that another very large depletion is again prescribed for its removal: and the patient, recollecting the relief it temporarily afforded him, readily consents. Blood is taken to full syncope — again relief is felt — again reaction returns — and again the local symptoms are reproduced: and thus, large depletion, full syncope, reaction, and the supervention on the original malady of some or all of the phenomena described above as the consequence of excessive loss of blood, are brought before the practitioner, and he is astonished at the obstinacy, course, and termination of the disease; which, under such circumstances, generally ends in dropsical effusion in the cavity of

5th, The passage into the blood of morbid matters formed in the same body that is the seat of disease.

111. *A. Of vitiation of the blood by the fluids which form it.*—The fluids which supply the waste of the blood are not infrequently vitiated, and thereby change the state of the circulating mass. The chief sources of this vitiation are hurtful or unwholesome ingesta. Many articles, even of food, will be hurtful when too long continued. The injurious effects of salt provisions on the blood, when exclusively employed, and particularly if depressing causes cooperate with this diet, are evident, and are fully illustrated in the article on SCURVY. The influence of diseased rye, in first changing the condition of the blood, and inducing a state of chronic arteritis, terminating in gangrene of the extremities, is also well known; and the effects of diseased or putrid flesh upon the system have been often noticed, although not always correctly traced to the quarters where the principal changes are produced. M. BERTIN states that a number of negroes in Guadeloupe, having eaten the flesh of some animals dead of an epizooty, were seized with fever, and violent ileus, of which the greater number died: and numerous cases are on record, where persons shut up in besieged towns, having partaken of putrid animal matter, or of the flesh of animals that have died, have been seized with malignant states of disease; and the blood has been found fluid, dissolved, blackish, grumous, &c. upon examination after death. In these, and numerous similar instances which might be adduced, although the state of the blood has been alluded to in general terms, the information has been deficient in precision, and has been furnished incidentally, the attention of the observer having been directed to other quarters.

112. M. MAGENDIE adduces in his Journal, the instance of a man, who, after a long use of vegetables in which the oxalates abounded, underwent the operation of lithotomy, and a large oxalate of lime calculus was removed from him. We know that a large proportion of both our mineral and vegetable medicines operate by being absorbed into the circulation (see art. ABSORPTION, &c.); and there is every reason to suppose that various morbid or foreign matters may pass with the chyle into the blood, and modify its condition. The excessive or long-continued use of alkalies, or of alkaline salts with excess of base, has the effect of diminishing the cohesion and the viscosity of the blood, and of preventing it from coagulating after it has been removed from the vessels; and while these substances thus, as it were, dissolve, or attenuate this fluid, they also diminish the vital cohesion and tonic contractility of the extreme vessels, and of the tissues, and create a disposition to extravasation of blood in the parenchyma of the organs, and to exudation of it from the mucous surfaces. On the other hand, the acids—particularly the mineral acids—turpentine, the acetate of lead, and all the salts,—especially those with excess of acid—have the effect of increasing the healthy crasis of the blood, and of producing an opposite change to that now stated. When used in excess, however, or injected into the veins, they have been conclusively shown to give rise to fibrinous concretions in the vessels, to coagulate the albumen of the blood, to darken its colour, and thus to render

it grumous, and unfitted for circulation through the minute capillary vessels, particularly those of the lungs. The influence of salted provisions, long and exclusively employed, in which the soda is generally in excess, in attenuating the blood, in preventing its coagulation when removed from the vessels, and in relaxing the soft solids; and the effect of acids in removing these morbid states, are well illustrated by the nature, progress, treatment, and prophylaxis of scurvy.

113. That the nature of the food materially affects the state of the blood is further shown by the general character of the diseases most prevalent in various communities, living chiefly on certain kinds of aliment. The inhabitants of several places in the north of Europe, who live principally on fish, a large proportion of which is usually kept until it has become remarkably stale, or even ammoniacal, from incipient decomposition, who seldom partake of flesh meat unless in a similar state of change, and who dry or smoke both these kinds of food, instead of salting them, are generally subject to diseases which arise from, or are connected with, an impure state, or weak cohesion, of the circulating fluid. It should not, however, be overlooked, that the more complete changes which respiration effects on the blood in cold climates, and the active exercise of the functions of depuration, under the influence of the vital energies, serve to counteract the morbid alterations which this cause would induce. Yet still the prevalence of disorder in these eliminating organs, particularly the mucous and cutaneous surfaces, which preserve the purity of the blood; and the marked disposition, which all febrile diseases evince, in persons thus circumstanced, towards vitiation of the circulating fluid; and the consequently low or adynamic symptoms which characterise their progress and termination; are sufficient indications of a change in the constitution of this fluid. It is worthy of notice, that communities which live in the manner now alluded to, generally employ remarkably acid beverages, usually consisting of the fermented whey of butter-milk, and a fermented farinaceous infusion. I believe that nothing could be used as common drink better calculated than these to counteract the ill effects of their diet on the blood. Besides the acid existing in these beverages, they also contain much carbonic acid gas, which likewise contributes to their wholesome influence on the blood.

114. The effects of living upon much fresh animal food, in increasing the quantity of fibrine, in rendering the blood rich and abundant, and in disposing to inflammatory diseases, are too well known in all their relations to require illustration. But when we consider the influence of various kinds of aliments in modifying the state of the blood, we ought never to overlook that, as its organisation and vital manifestations commence with the chyle, and depend upon the vital condition of the vessels and tissues, and upon the perfect discharge of all the functions which contribute to its formation and purification, the extent of mischief produced by unwholesome food will be commensurate with the deficiency of vital energy, and the imperfection of the various organic functions. A person of a robust constitution, breathing a pure air, and assisting the eliminating functions by regular exercise, will suffer much less, than the debilitated, the indolent,

tion. At the same time many of the substances mentioned above may be employed as beverages, condiments, or preventives; more particularly the medicines formerly denominated antiscorbutics, the citric acid, lemons, lemon-juice with sugar; vinegar in which the warm spices, as capsicums, have been infused; the chlorides, camphor, quinine, &c. As it has been satisfactorily shown that great excitement and acceleration of the circulation, besides exhausting nervous and vital power, have also the effect of changing, and even of corrupting, the state of the blood, such excitement should be prevented, and allayed when present, by appropriate evacuations, and by refrigerant saline medicines and beverages.

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ania, Good. Cyanose, Fr. Die Blausucht, Ger. Blue Skin, Blue Jaundice.

CLASSIF. 3. Class, Sanguineous Function; 4. Order, Cachexies (Good). IV. CLASS, II. ORDER (Author, see Preface).

1. **DEFIN.** A blue violet, or purple colour of the integuments, particularly of parts usually presenting a rose or flesh tint, as the cheeks, lips, mucous surfaces, &c.

2. A blue or purple colour of the integuments of parts, or nearly the whole of the body, may occur as a symptom in the last stage of various acute diseases. But it is present from the beginning of this affection, is frequently connected with comparatively little disturbance until some sudden change takes place, and generally results from chronic organic lesion. In other maladies this colour is an accidental, occasional, and not the most important symptom; in this affection it appears as the only, or the most remarkable, change observed during life.

3. I. ITS PATHOLOGY.—According to M. GINTRAC, who has directed much attention to this affection, it always proceeds from organic change of the heart or large vessels; the admixture of venous with arterial blood, and the distribution of it to the surfaces of the body, being the immediate or essential cause of the alteration of colour. This pathology agrees with the opinion of SENAC and MORGAGNI: it has, however, been disputed. M. CORVISART first threw out doubts of the constant origin of cyanosis in this source; and more recently MM. FERRUS, BRESCHET, MARC, LOUIS, FOUQUIER, and CRAMPTON, have adduced facts which seem to militate against it, while it has received the able support of M. BOUILLAUD.

4. M. FERRUS contends, 1st, That cyanosis sometimes has existed to an intense degree, and yet upon *post mortem* examination no lesion could be detected admitting of the admixture of venous blood; nor any organic change of the heart or respiratory organs: 2d, That the opening of Botal may continue unclosed for many years without blueness of the surface being occasioned: and, 3d, That the admixture and circulation of venous with arterial blood have been demonstrated to occur in some cases, without giving rise to this peculiar appearance. That the second and third objections are well founded seems almost incontrovertible. Numerous instances have been recorded by Louis, and others, which fully prove these facts. I have met with cases in children, where the communication between both sides of the heart seemed very free, and yet no alteration of the natural colour existed; and others, in which the change was evident during the paroxysms of suffocation only. But I must agree with CORVISART, RICHERAND, CLOQUET, GINTRAC, and BOUILLAUD, that the existence of this opening is no certain proof of admixture of the venous and arterial blood; for if the contractile powers of both ventricles are nearly equal, in relation to the resistance to be overcome, and if the natural openings of the cavities be not obstructed, no admixture of the blood in both sides of the heart could take place.

5. The principal force of the objections, therefore, urged by M. FERRUS, evidently rests upon the fact of the non-existence of organic disease of the heart, large vessels, or lungs, in some cases of the disease,—a fact which is still not satis-

BLUE DISEASE. SYN. Cyanosis, (κύανος, blue, and νόσος, disease,) Beaumes. Morbus Cæruleus, Cyanopathia, Marc. Exangia Cy-

delirium; in the *non-inflammatory* form of *softening*, the intellectual faculties are enfeebled, or much weakened; the countenance is generally pale, colourless, or sometimes even sunk; whereas in *inflammatory softening* it is red, or more or less injected, or even tumid.

220. *B. Indirect symptoms.* — *a.* In this second stage of the disease, the organic functions are more or less affected: there is no appetite; the teeth and gums are dry, the tongue rough, brown, blackish, chopped or traversed by small fissures; deglutition is difficult: sometimes there is vomiting, first of the ingesta, and afterwards of bile: all the excretions are involuntary; frequently there is constipation: respiration is laboured, and at last stertorous; the pulse feeble, frequently irregular or unequal, or even intermittent, and the skin is cold. — *b.* In *inflammatory softening* there is great thirst, redness of the tongue, sensibility of the epigastrium and abdomen, hot skin, a strong and frequent pulse, &c. (See § 170.)

221. The second period may be of longer or shorter duration. The morbid phenomena often continue stationary for a considerable period, and then make rapid progress; at other times the progress is slight, but constant; in some cases it is constant and remarkable. This disease very rarely retrogrades or evinces much amelioration; its progress is essentially continued and increasing. The *anatomical characters* of softening have been already fully described (§ 70, *et seq.*). It may be stated in general, that when it is the result of inflammatory action, as it most frequently is, 1st, The colour of the softened part is, more or less, deeper than natural, or of a rose tint; 2d, It contains a certain quantity of pus, sometimes infiltrated through the softened tissue; and, 3d, Febrile symptoms have existed previously to the death of the patient.

222. *ii. TREATMENT.* — It is unnecessary to add any thing to what has been already advanced respecting the treatment of the inflammatory states of softening, which are essentially the consequence of partial cerebritis (see § 191, *et seq.*). When, however, the disease does not present an inflammatory character, it becomes necessary not only to enjoin abstinence from all debilitating means, but from the commencement to apply rubefacients, to throw irritants into the great intestines (see *Enem. F.* 141. 150.), and to have recourse to tonics, aromatics, &c., of which the sulphates of zinc, iron, or quinine, in small doses, with sulphuric acid, or the less heating astringent tonics belonging to the vegetable kingdom, are the most eligible; preserving, at the same time a regular state of the alvine secretions and evacuations, and of the other digestive functions.

223. *Regimen.* — The gently tonic, chalybeate, and aperient mineral waters are of service in the non-inflammatory form of the disease; whilst those only which are aperient and deobstruent should be ventured upon in its inflammatory states, when they may be tried and varied; local evacuations, revulsives, particularly setons, issues, &c., being kept discharging at the same time. In both forms of the disease, gentle travelling, and change of air, and agreeable and quiet amusement, without undue mental excitement of any kind, will be of much service. M. ROSTAN'S injunctions under this head may be summed up as follows: — Those alimentary and medicinal sub-

stances which exert a strong and speedy action on the encephalon, should be strictly shunned. Wine, spirits, coffee, and spices, are of this number. Excess at the table is dangerous. The diet should be mild and moderate, and the food easy of digestion, but not too nutritious. The impression of cold air on the head may be favourable: sudden passage into a heated place must be avoided: the patient should inhabit a cool situation. Whatever, by compressing the limbs or the organs contained in cavities, may favour cerebral congestion, must be rigidly proscribed. Warm, as well as cold bathing should be interdicted: tepid bathing alone may be permitted, although with much caution. Cold lotions to the head are advantageous in the inflammatory form of the disease, provided we do not permit reaction to be established; at the same time pediluvia containing mustard may be prescribed. The ordinary excretions should be kept up; but sexual indulgence, too violent exercise, strong emotions, long study, and watching, should be carefully avoided. The age, strength, constitution, habits, and state of the patient, and the character of the symptoms, must modify these precepts.

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small ones; in others, an opposite disposition is remarked. Occasionally the redness only exists in intervals, in the form of bands or of isolated spots, forming, as it were, as many circumscribed phlegmasiæ, between which the mucous coat is white and healthy.

56. *B.* When the inflammation is *chronic*, the mucous membrane generally loses its lively redness: it presents a livid, violet-coloured, or brownish tint. Finally, and what is very remarkable, in individuals offering all the symptoms of inveterate chronic bronchitis, with puriform expectoration, the mucous membrane of the lungs has been found scarcely rose-coloured, and even perfectly pale through its whole extent. BAYLE and ANDRAL have particularly noticed this fact. I would not wish to conclude that there is not, and least of all, that there has not been, inflammation in these cases; but I think a very copious secretion will often take place from mucous surfaces, and assume even a purulent appearance during its retention in the bronchi, from lost tone of the extreme capillary vessels, with, perhaps, an increased flux or determination of the circulating fluid in order to supply the discharge, all vascularity disappearing with the cessation of circulation. The other changes observed on post mortem inspection, particularly in the more chronic states of bronchitis, consist chiefly of thickening, softening, ulceration, &c. of the mucous membrane, dilatation of the bronchi, &c. (See § 7, *et seq.*)

57. *v. DIAGNOSIS.*—The characters of the cough, and of the sputa, and the physical signs, are our chief guides in the diagnosis of bronchitis. The history I have given of the disease will be generally sufficient to enable even the inexperienced to recognise it: but it will often be necessary to arrive at more precise and certain information as to the extent of lesion, and its existence either in a simple or in a complicated form.

58. *A. Of the acute.*—*a. By auscultation.*—In the first stage of the disease, the inflammation causes tumefaction of the mucous bronchial surface, and consequent diminution of the calibre of the tubes. This state occasions a modification of the respiratory sound in them: and, hence, either with the unaided ear, or with the stethoscope, we hear at first the “dry bronchial rhonchus;” consisting chiefly of a sibilous or whistling sound; occasionally with a deeper tone, resembling the note of a violoncello, or the cooing of a pigeon, particularly when the large bronchi are affected. These sounds (see AUSCULTATION, § 14.), denominated the *sibilous* and *sonorous rhonchi*, are present chiefly in the early stage, and before expectoration takes place; and prove the accuracy of the rational inference of Dr. BADHAM, that the difficult breathing of this period is owing to the state of the mucous membrane; and I would add, of its sub-mucous cellular tissue also. To these sounds is added the *mucous rhonchus*; and in proportion as the bronchial secretion, to which it is owing, augments, this sound becomes predominant. When the inflammation is seated in the large tubes, the bubbles of mucous rhonchus are large and uneven; and the respiration may be still heard over the chest. But when the mucous rhonchus is fine, and is heard constantly, it may be inferred that the small bronchi are invaded. When this is the case in a severe degree, there is

also slightly diminished resonance of the chiefly affected part upon percussion. As the disease proceeds, and the secretion passes into an opaque and thickened state, the mucous rhonchus becomes interrupted, sometimes with obstruction of the respiratory sound in a portion of the lungs, and passes into a sibilant or clicking sound. These changes arise from the entire or partial obstruction of one or more tubes by the thickened mucus, and are generally of temporary continuance: occurring now in one part of the chest, and disappearing; and now in another. This state of the bronchi fully explains the dyspnoea of this stage.

59. *b. Rational diagnosis.*—*a.* The cough in bronchitis is loose, diffused, and deep; in paroxysms, and attended with fever, often with wheezing. In *pertussis*, it is in severe paroxysms, unattended by fever or wheezing; is accompanied with a distinct whoop; and terminates in vomiting. In *croup* it is sonorous, clanging, and harsh. In *laryngitis*, it is suffocating, shrill, or grunting; and, on inspiration, attended with a drawing down of the p^ost^um Adami to the sternum, and retraction of the epigastrium and hypochondria. In *pneumonia*, it is deep in the chest; frequent and short, often hard; and gives a metallic sort of noise. And, in *pleuritis*, it is short, dry, hard; sometimes slight, but always suppressed and painful.—*β.* The expectoration in bronchitis is abundant after the second or third day, or even from the first: in *pertussis*, it only follows the vomiting: in *pneumonia*, it is more rounded, distinct, thickened, purulent, rusty, and intimately streaked with blood: in *pleuritis*, *croup*, and *laryngitis*, it is scanty, thin, frothy in the latter; sometimes with shreds or pieces of lymph, and entirely different in appearance from that of bronchitis.—*γ.* Pain in bronchitis is scarcely complained of; and consists merely of a sense of soreness, heat, and tightness in the chest, particularly beneath the sternum, and is not increased on full inspiration: in *pneumonia*, it is more marked, especially in certain parts of the chest, generally nearer the lateral regions, and is increased on inspiration or prolonged expiration: in *pleuritis*, it is very acute, and a full inspiration is impossible: in *croup* and *laryngitis*, the pain is increased upon pressing the trachea and larynx.—*δ.* The countenance in bronchitis is more frequently pallid or bloated; in *pneumonia*, it is generally flushed; and dyspnoea is greater in the former than in the latter. The breathing is *wheezing* and *hurried* in acute bronchitis; in *pneumonia* it is less so, and generally without the bronchial wheeze. The pulse, in the former, is frequent, full, free, developed, and soft; in the latter, full, hard, bounding or vibrating, and sometimes oppressed and undeveloped. The general febrile symptoms are more continued in *pneumonia* than in bronchitis; morning remissions, with free perspiration, being more frequent in the latter than in the former. The physical signs in *pneumonia*, *pleuritis*, &c., are the surest means of their diagnosis. (See art. LUNGS—Inflammation of.)

60. Some cases of *asthenic bronchitis* may be mistaken for *humoral asthma*; and occasionally no very distinct line of demarcation can be drawn, both affections either insensibly passing into each other, or being complicated with one another. But, generally, the slow accession of the former,

inspiratory whoop, and vomitings, not appearing for some days subsequently. In other cases—and those, perhaps the most numerous,—the inflammatory affection has not appeared until after the invasion of pertussis. When thus associated, bronchitis may be either sthenic or asthenic; the one or the other being more generally prevalent in some seasons than in others. During the years specified above (§ 83.), the asthenic state was most common; and I have seen several cases in which sanguineous depletion had been injudiciously practised, particularly as respects quantity. Cerebral symptoms are apt to occur during this complication, and also infiltration or hepatisation of a part of the substance of the lungs. These unfavourable terminations should be anticipated and prevented by small local depletions,—by leeches applied behind the ears; by the exhibition of camphor combined with ipecacuanha or antimonials, and narcotics, particularly conium or hyoscyamus; by diaphoretics with diuretics; and more especially by the use of the liniments and revulsants already recommended (§ 79.). (See HOOPING COUGH.)

87. *f.* The simultaneous occurrence of inflammatory action in both the *digestive* and respiratory mucous surfaces is not infrequent, particularly in children; and means calculated to benefit the one, generally aggravates the other, or risks the accession of cerebral disease. I have found small local depletions, followed by the pulv. ipecacuanhæ comp., combined with small doses of calomel, or hydrarg. cum creta and camphor; the warm bath and frictions, with the stimulating liniments already specified (§ 79.); the application of blisters for a few hours only, and often repeated; the liq. ammoniæ acēt., with spirit. æther. nit., camphor mixture, diuretics, &c., constitute the principal means of cure.

88. *g.* The association of *hepatic disorder* with bronchitis is not rare. But the affection of the biliary organs does not always precede the bronchial disease: it often occurs in its progress; an increased, as well as a morbid, secretion of bile supervening, probably in consequence of the vicarious increase of function of the liver, and its irritation by, and elimination of, the morbid elements accumulated in the blood owing to the impeded function of the lungs. This complication requires the use of mercurial purges combined with camphor and antimony, particularly James's or kermes powder (F. 637.); external irritants and revulsants, cathartic enemata (F. 151.), &c. A similar treatment is indicated when the disease is connected with the translation of erysipelas, gout, or rheumatism.

89. *h.* If the inflammation extend to the *substance of the lungs or pleura*, the antiphlogistic treatment should be rigorously enforced: the solution of the potassio-tartrate of antimony ought to be given in frequent doses, and carried as far as circumstances will permit; internal and external revulsants resorted to at the same time; and diaphoretics and diuretics suited to individual cases prescribed. In some instances, either *colchicum* or *digitalis*, or both, may be substituted for the antimony; but they answer better, particularly the *digitalis*, after this medicine has previously been used. If we have reason to suppose that *effusion of serum* has taken place in the thoracic cavities, diuretics, and, amongst others, *digitalis*, should be employed; re-

collecting, however, that the accumulative and sinking effects of either *digitalis* or *colchicum* sometimes appear very rapidly, and in an alarming degree, when they are given either at the same time or after the exhibition of the potassio-tartrate of antimony. Disease of the brain or its membranes supervening in the course of bronchitis has been considered in the article BRAIN (§ 186.).

90. The SUB-ACUTE FORM of bronchitis requires in all respects the same treatment as the acute uncomplicated disease, but not carried so far; the activity of the means should have due relation to the acuteness of the attack, and the effects they produce.

91. 2d. OF CHRONIC BRONCHITIS.—M. BROUSSAIS has very justly stated the indications of cure in chronic bronchitis to be, 1st, to diminish the general excitability, and to keep the circulation quiet; 2d, to solicit the excitement and the fluids to other organs, particularly towards the skin; and, to these I would add a 3d, namely, to restore the healthy tone and functions of the bronchial surface, by means which seem to have this effect either directly or indirectly. It is obvious, however, that the accomplishment of the first and second intentions have an indirect influence in bringing about the third.

92. *a.* General *blood-letting* is inadmissible in this state of the disease; and even local bleedings should in many cases be employed with caution. Cupping, however, to a moderate extent, is very frequently required; and it is evidently more advantageous to repeat the operation to a small extent, than to abstract a large quantity at once. When the disease has existed long, and is attended with a copious discharge, much general debility, and absence of pain upon full inspiration, even local depletion cannot be ventured on. Next in importance to depletion is *counter-irritation*; and for this purpose several means are presented to us. When there is a tendency to acute action, or when the cough is at all painful, and the sputum puriform, either the tartarised antimonial ointment, or a large issue or seton in the side, is preferable: but when there is very marked relaxation of the bronchial mucous surfaces, blisters, and rubefacients, or a succession of them, seem more appropriate. I have, however, found, in a number of cases, the *liniments*, No. 296, 297, 311, in the Appendix, productive of much greater advantage, and more generally applicable, than either blisters or the ointments. They may be employed once or twice daily. The vapour arising from them, and diffusing itself around, has also a direct and beneficial effect, by being inhaled, upon the diseased mucous membrane. M. BROUSSAIS is very favourable to the use of *setons* and *issues*; and I have seen several instances of marked benefit from them, particularly in the obstinate state of the disease which simulates tubercular phthisis. He also recommends warm cataplasms to the chest, made rubefacient by the addition of mustard. I have seen advantage produced by warm bread and water poultices applied over blistered surfaces, and the seats of issues formed by the mezereon bark, and by the same kind of poultices, to each of which one or two table-spoonful of the nitro-hydrochloric lotion (F. 834.) had been added. But it is chiefly early in the chronic disease, or when it has recently passed into this state from the acute, that issues and setons prove successful. They exhaust the energies of the system too

the chlorate of potash, are required. If the child be not very young, either of these latter may be combined with belladonna, or with conium, and given in honey or syrup of squills; or with simple syrup, sugar, powdered liquorice-root, or with the compound tragacanth powder. When the disease is associated with chronic irritation of the mucous surface of the bowels, the chlorate of lime will be of much service, and will soon restrain the latter affection; the use of the *liniments* already recommended (F. 296. 311.), in addition, generally contributing to cure the bronchial disease. Either of these liniments has often been sufficient of itself to remove all disorder, both in the consecutive states, and in the different complications noticed at this place; and, when bronchitis seems to have a tendency to terminate, or has actually terminated, in effusion, they have powerfully assisted the treatment. When, however, dropsies supervene, in addition to them, colchicum or digitalis, with astringent tonics; squills, with blue pill, taraxacum, or extract of sarapavilla; the preparations of *iodine*, alone or with narcotics; bi-tartrate of potash, with the bi-borate of soda, particularly this last; and various other diuretic and deobstruent medicines in different forms of combination—of which numerous examples are given in the *Appendix*—and the general plan of treatment recommended in the article *Dropsy*; should be employed.

103. C. *The regimenal treatment* of bronchitis requires strict attention.—*a.* In the *sthenic acute* disease it should be strictly antiphlogistic; and, at the commencement of convalescence, a farinaceous diet adopted, until out-of-door exercise may be taken, or shortly before. In the *asthenic states* of acute bronchitis, this regimen is chiefly applicable to the commencement of the disease: subsequently, nourishment in small quantities, suited, in kind and frequency of partaking of it, to the state of the symptoms, the powers of the digestive organs, and feelings of the patient, should be permitted; and even animal food of a digestible nature, in moderate quantity, may in some cases, particularly in the aged, be permitted once a day. The decoction of Iceland moss, jellies, mucilaginous and emollient soups; shell-fish; the different kinds of white fish, dressed either with sweet oil or the oil obtained by boiling their fresh livers; the lighter kinds of animal food; and, in the case of infants, attention to the milk of the mother, or a healthy wet-nurse; are all occasionally of service during early convalescence from the *acute* forms of bronchitis, and in the progress of the more febrile states of the *chronic* disease. In the more *asthenic* cases of this latter, or when the expectoration is profuse, the skin cool and moist, and the habit of body lymphatic, relaxed, or wasted, animal food, especially fresh beef or mutton, underdone, and in moderate quantity; new-laid raw eggs; or a due proportion of digestible and stimulating food; will be found most serviceable. In nearly all the *chronic* states of the disease, particularly in their advanced stages, a light nutritious diet is necessary.

104. *b.* The patient's *beverage* should receive particular attention. Lemonade, imperial, barley-water, and the cooling and aperient drinks prescribed in the *Appendix* (F. 538—595. 916.), should be employed in the *sthenic* form of the *acute* disease. In the *asthenic* and *chronic* states,

the red Bourdeaux wines, or the wines of Burgundy—the former generally reduced by one third or one half water; or beer or ale, also reduced, to which a little of the liquor potassæ, or of Brandish's alkaline solution, has been added, may also be tried at meals; and either of these, or of the more cooling beverages, adopted, that may be found to agree best with the patient. If the disease evince a disposition to terminate in dropsy, the imperial drink, with the addition of a little bi-borate of soda, or F. 590. 591., will be most serviceable. In the advanced period of *chronic*, or during convalescence from *acute*, bronchitis, the sulphureous mineral waters will often be beneficial. Those of Harrowgate, Leamington, or Moffat, may be tried; or of Enghein, Bonnes, Barèges, or Cauterets (Rochx); or the artificial waters of Ems or Carlsbad.

105. *c.* Few diseases are more benefited than chronic bronchitis by *change of air*. A residence on the southern coast, particularly at Torquay, and in various other parts of Devonshire, during the winter and spring months, guarding against vicissitudes of climate,—which, however, is milder and less variable in this part of the island than any where else; wearing flannel next the skin, especially during winter and spring; gentle exercise on horseback, or the use of the swing; and constant attention to the state of the bowels; are severally of great importance. During the progress of convalescence, as well as in the earlier stages of disease, particularly if the secretion from the bronchi continue, it will be necessary to resort occasionally to an emetic; and in a day or two subsequently, notwithstanding the bowels may be freely open, to an active cathartic. In these cases, the addition of a vegetable bitter or tonic to a purgative medicine,—as the sulphate of quinine to aloes, or the infusion or extract of gentian to senna,—will have a decidedly cathartic operation, without lowering the energies of the frame. There are few diseases more benefited, either in their progress or decline, than those now discussed, by active purging; but it will often be requisite to combine the purgatives with stimulants or tonics, in order that an active or continued operation on the bowels may not exhaust the patient. During convalescence, the free use of purgatives requires a liberal and invigorating diet.

106. V. *DILATATION OF THE BRONCHI.*—*i.* The *anatomical characters* and *physical signs* of this change of the bronchi have been already described (§ 19.). It is almost entirely a consequence of, or an attendant upon, the more chronic cases of bronchitis, or of hooping-cough complicated with bronchitis. The expectoration, besides being copious and puriform, is often foetid,—a diagnostic symptom of this alteration, without which, M. Louis, and other pathologists, who have devoted much attention to pulmonary diseases, have sometimes failed of distinguishing it from phthisis.

107. *ii.* The *TREATMENT* of this alteration is nearly the same as that which has been recommended in the more chronic states of bronchitis. The means which are especially indicated consist of the *inhalation* of balsamic and terebinthinate fumes; of those of creasote, chlorine, iodine, &c. (§ 99. 100.); the internal use of balsams, tonics, and bitters, particularly the sulphates of quinine, or of zinc, or iron;

and other preparations of cinchona or steel; with the use of the liniments already noticed (§ 102.); or the nitro-hydrochloric acid lotion on the chest. The chlorate of potash, or of lime, seems indicated in this form of the disease. An open state of the bowels, an occasional cathartic, nutritious diet, and change of air, are also evidently required. In other respects, the treatment already detailed (§ 101. *et seq.*) may be followed; or modified according to the peculiarities of the case.

108. VI. **ULCERATION OF THE BRONCHI** (see § 7, 8.) is another alteration which is produced by, or is attendant on the advanced stages of, chronic bronchitis; most frequently, however, when complicated with tubercular phthisis. It is not infrequently met with, particularly after bronchitis occasioned by the mechanical irritation of mineral, vegetable, or animal molecules. The existence of ulceration, when seated in the bronchi, is not indicated by any sign in addition to those which accompany the most chronic states of bronchitis, or tubercular disease, when it arises from, or is complicated with, this change. When affecting the **LARYNX** or **TRACHEA** (see these articles), it may frequently be suspected, or occasionally prognosticated. In a case which occurred in the trachea, a prognosis to this effect was given by me long before death.

109. The **TREATMENT** of this lesion, even could its existence be ascertained during life, cannot be different from that required in some other states of chronic bronchitis. That ulceration may take place in the bronchi, and heal, as evinced by the appearance of cicatrices, has been ascertained by M. LAENNEC, and other pathologists. In addition to the means of cure already described, the establishment of local drains of the most active kind is obviously required. Blisters and issues applied to a distant part have not been found of use by M. LAENNEC. He prefers the repeated application of small moxas as near the seat of disease as possible, and the preservation of absolute rest and silence. The inhalation of emollient, anodyne and balsamic vapours and fumes may likewise be tried; and, if the disease be devoid of marked febrile excitement, the expectoration abundant, and the powers of life consequently reduced, the treatment advised for dilatation of the bronchi (§ 19.) may be employed in all its parts. (For the treatment of other organic changes of the air-passages, see arts. **CROUP**, **LARYNX**, **LUNGS** — *Hæmorrhage from, and TRACHEA.*)

VII. **BRONCHIAL FLUX**. — *Bronchorrhœa* (from *βρόγχος* and *ρῆμα*.) — **SYN.** *Bronchorrhée* (Roche); *Catarrhe Pituiteux* (Laennec); *Mucous Flux*.

CLASSIF. I. CLASS, III. ORDER (*Author*).

110. **DEFIN.** *A flux of watery mucus, or phlegm, from the chest, with more or less cough, but without fever; frequently occasioning exhaustion.*

111. This affection varies considerably. It is often a variety of chronic bronchitis; being consecutive of it in persons advanced in life, or those of a relaxed and phlegmatic or pituitous habit of body. In other cases it appears from the commencement, or consecutively of slight catarrh, as intermediate between chronic bronchitis and humoral asthma. This appellation may, upon the whole, therefore, be viewed as applicable to those cases which are attended with a more

abundant, fluid, and transparent expectoration, than is observed in chronic bronchitis, and are devoid of fever and all other signs of inflammatory action; whilst they are equally without the severe dyspnoea, the paroxysms of suffocation and cough, and the intermissions, characterising humid asthma.

112. i. *Bronchorrhœa* proceeds generally from similar causes to those which produce common catarrh, or bronchitis, even although it be not consecutive of some one of the forms of bronchial inflammation. It is very frequently, either at its commencement, or recurrence, connected with cold and moist states of the atmosphere, or occasioned by exposure to cold in some one or other of its forms. When it occurs as a sequela of bronchitis, it may be viewed as arising from lost tone of the vessels and of the bronchial surface, the flux or determination to this part still continuing, from peculiarity of habit or some other cause, after all inflammatory and febrile symptoms have been removed. Thus, it is very frequent in aged persons of relaxed fibres, who have experienced repeated attacks of pulmonary catarrh.

113. ii. *Diagnostic Symptoms.* — *Bronchorrhœa* may be distinguished from chronic bronchitis, tubercular phthisis, and humoral asthma, by the following characters: — The quantity of fluid expectorated is very great; being in some cases, as much as four or five pounds in the twenty-four hours. The sputum is colourless, ropy, transparent, slightly frothy on the surface, and resembling the white of egg mixed with water. It is without the thickened sputa generally accompanying chronic bronchitis. There is considerable dyspnoea, but the chest sounds well throughout upon percussion; and the cough is slight comparatively to the quantity of the expectoration, being evidently no more than is occasioned by the discharge of the secreted fluid. The pulse and temperature of the skin are natural, and there are no night sweats. The appetite is generally unimpaired; and emaciation is not remarkable, or not at all observed, unless the quantity of the sputum be extremely great. M. NAUCHÉ states, that the expectoration in this state of disease is always more or less acid, and reddens litmus paper, whilst that proceeding from inflammatory action restores the blue tint to this paper after being reddened by acids. On auscultation, the respiratory murmur is commonly weak, but is very rarely suspended. The sibilous rhonchus is heard more or less distinctly, and often mixed with the sonorous, and occasionally with the mucous rhonchus, the bubbles of which seem to burst upon the surface of a fluid of less consistence than in bronchitis.

114. *Bronchorrhœa* usually commences with catarrhal symptoms, and frequently without fever. In other cases, after bronchitis has continued chronic for a longer or shorter period, the expectoration becomes less consistent and less opaque, more abundant, and similar to that described; and the affection becomes established, — aggravated at times by disorder of the stomach or bowels, or by changes of the air, especially by cold and moisture, or by arrest of the cutaneous transpiration from any cause, — and ameliorated at other times by a warm dry air, an open state of the bowels, and light nourishing diet, taken in

moderate quantity. Vacillating in this manner, the disease may continue for years if it be not severe, without materially affecting the strength. But more frequently the discharge increases, after irregularly prolonged, and more or less slight intervals; the patient loses his flesh, and becomes paler; his strength is impaired; dyspnoea increases; and, in some cases, the affection either runs into humoral asthma, or the quantity of expectoration is augmented so as to exhaust his energies, and to occasion suffocating paroxysms of cough. In rarer cases, the quantity of the bronchial discharge has been so great as to occasion the exhaustion and death of the patient. M. ANDRAL has detailed two cases of this description, wherein, upon *dissection*, no evidence of inflammation or congestion could be found in the air-tubes. M. ROCHE, has described, what he has designated an acute form of this affection, which other French pathologists have named *catarrhe suffocant*; but it differs in no respects from the more humoral states of asthma, described in its more appropriate place, and presenting all the symptoms of spasm of the air-passages, with a copious viscid expectoration; the spasm and other symptoms subsiding after the bronchi and trachea are unloaded of the secretion accumulated in them. Bronchorrhoea has, in rare instances, been the means of removing other diseases. M. ANDRAL states that he has seen hydrothorax disappear after the establishment of a copious bronchial flux.

115. iii. TREATMENT. — After the full exposition that has been given of the means of cure in the different states of chronic bronchitis, to some of which bronchorrhoea is closely allied, it will be sufficient to enumerate succinctly the various means which are applicable to this affection. As the disease essentially consists of an increased secretion and exhalation from the respiratory mucous membrane, with a determination of the circulation to that quarter, and deficient tone of the vessels distributed to it, the obvious indications are, to increase the secretions from other surfaces and organs, thereby to derive from the lungs, and to restore the lost tone of this membrane and its vessels. In some cases, accordingly, it will be advantageous to commence with an ipecacuanha or sulphate of zinc *emetic*, and afterwards to act freely upon the secretions and alvine excretions by purgatives. I have never seen a case of the disease which has not been much relieved by purgatives; taking care, however, that they should not lower the energies of the constitution, by combining them with tonics, bitters, or stimulants, and allowing sufficient light nourishment to admit of this mode of derivation being satisfactorily employed. In the intervals between the exhibition of purgatives, diuretics and diaphoretics may be exhibited, and the cutaneous functions promoted by wearing flannel next the skin during the winter and spring months.

116. *Expectorants* are very much employed in this affection; but some of this class of medicines are seldom of benefit in it, unless combined with opium. The *balsams* and *terebinthinates* (F. 484—487. 489.); the sulphate of zinc, with myrrh, or the compound galbanum pill; and either of these, with camphor and opium; are often of service. In addition to these, *inhalations*,

as recommended in another part (§ 99, 100.), may be employed. Although astringents and inhalations are often required, yet we should be cautious in using them when the disease has been of very long continuance, particularly in persons advanced in age, or when there is any irregularity of the action of the heart, or physical sign of organic change about this organ, complicated with it; inasmuch as the arrest of an habitual discharge will, in such circumstances, risk the supervention of effusion in the cavities of the thorax. It will be more judicious, in these cases, to confide in purgatives combined with bitter tonics; in diuretics, and in diaphoretics, so as to moderate the discharge, and prevent its increase, or its exhausting effects upon the system. At the same time the vital energies should be promoted by a light nutritious diet, moderate exercise, and change of air, with the sulphureous or gently tonic mineral waters. In other cases, where the age of the patient, the regular or healthy state of the heart's action, the absence of leucoplegmæa, and the circumstances of the case altogether, are such as to preclude dread of the consequences of suppressing this discharge, cold sponging the surface of the body by the nitro-hydrochloric lotion, &c. (§ 101.), and the liniments already noticed (F. 296. 311.), with the internal use of the more astringent tonics, particularly the sulphate of iron or of quinine, in addition to the measures already recommended, may also be practised.

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BRONCHOCELE (from *Brôyxos*, throat, and *kele*, a swelling). **SYN.** *Hernia Gutturalis*, *Gosum*, *Lufttröhrenbruch*, *Kropf*, Ger. *Goître*, Fr. *Broncocele*, *Gozzo*, Ital. *Thyrophraxia*, *Alibert*. *Cynanche Thyroidea*, *Conradi*. *Goître*, "Derbyshire Neck."

CLASS-IF. 4. Class, Local Diseases; 6. Order, Tumours (*Cullen*). 6. Class, Excrement Function; 1. Order, Affecting the Parenchyma (*Good*). IV. CLASS, IV. ORDER (*Author*, see *Preface*).

1. **DEFIN.** Chronic enlargement of the thyroid gland, sometimes with change in the surrounding parts, generally increasing slowly, often continuing for years, and depending upon constitutional causes.

2. 1. **CAUSES, AND MORBID RELATIONS.**—This disease is *endemic* in Derbyshire, and some other parts of this country; but most remarkably so in Switzerland, various adjoining districts, and in some places in South America. It usually occurs during the early epochs of life, most frequently about the period of puberty, in persons of a weak and lax fibre, and generally in females; it very seldom being observed in Great Britain in males: but the comparative frequency of it in the latter sex is greater in Switzerland, and other parts where it is very prevalent, and is connected with cretinism. In a considerable number of cases which have come before me in females, I have never met with any before the period of commencing puberty,—not even at the Infirmary for Children; although the menses have often been delayed for a year or two, or even longer, when the tumour has appeared at this epoch; and I have seldom observed an instance in this sex unconnected with some kind of irregularity of the menstrual discharge, or disorder of the uterine functions. In two cases, occurring in married females, who were under my care, unhealthy or irregular menstruation had existed during the continuance of the goitre; in one case for eight years, in the other for five: upon its disappearance, pregnancy took place in both. Suppression of the menses has sometimes caused its sudden appearance and rapid development; and it more rarely has originated during pregnancy and the puerperal states. Authors have adduced conclusive proofs of its occurrence hereditarily, independently of endemic influence.

3. *Dr. Good* has attributed the disease, in a great measure, to poverty, and the nature of the food: the rich being exempt from it. This is, however, very far from being the case. I have seen several cases of bronchocele in the richest of this metropolis. He is also wrong in attributing it to the use, in Derbyshire, of *oaten cakes*. In Scotland, where this article of diet is in general use, bronchocele is rare.

4. That it chiefly depends upon certain physical causes is shown by its prevalence in certain districts in preference to others, and by the circumstance of its disappearance when persons affected by it endemically have changed their

residence. *M. Alibert* mentions his having seen it disappear after a residence in Paris. It has been very generally imputed to the water used by those affected. Since the time of *PLINY*, it has been attributed to the use of snow water. But it prevails in several places where this cause does not exist, as in Sumatra, and several parts of South America. The Swiss who drink snow water are free from the disease, while those who use hard spring water are most commonly affected. Captain *FRANKLIN* states, that at a part in his journey to the Polar Sea, where bronchocele prevails, it is confined to those who drink river water, and that those who use melted snow escape. *Mr. BALLY* ascribes its frequency, in a district in Switzerland, to the use of spring water impregnated with calcareous or mineral substances; and he states, that those who use not this water are free from both goitre and cretinism. *Dr. COINDET* observed that the inhabitants of Geneva, who drink the hard pump waters, are those most liable to bronchocele. Its prevalence in Nottingham is ascribed by *Dr. MANSON* to the same cause; which also seems to occasion it in Sussex and Hampshire, in the valleys of which counties it is frequently met with.

5. That this is, however, not the only cause, may be inferred from other physical circumstances connected with its endemic prevalence. Its great frequency in low, moist, marshy, and warm valleys, and the exemption of the inhabitants of dry and elevated situations, have been shown by *LARRY*, *FODÉRÉ*, *SAUSSURE*, *REEVES*, *CLARK*, *VALENTIN*, *POSTIGLIONE*, and *J. JOHNSON*, as respects various districts in Switzerland, the Tyrol, Carinthia, the Vaud, and the north of Italy. Similar facts have been adduced by *Dr. GIBSON*, and *HUMBOLDT*, in regard to the United States, and South America. It is most probable, however, that the exhalations from the soil of those localities are not the only, but a concurrent cause, co-operating with others possessing equal influence in the production of the disease, and particularly with the nature of the water. But it as certainly sometimes appears where neither of those causes can be traced, as in London; disorder of some kind in the uterine functions being the most frequent morbid relation it has presented, as far as my experience has gone. Its connection with cretinism in the districts on the Continent above alluded to, and the occasional appearance of the disease at very early periods of life—it being even sometimes congenital, in these countries, as well as being more common there in the male sex than in this country—are matters of some interest, and not readily admitting of explanation; since poverty, close, confined, and ill-ventilated apartments, are not the chief causes of those phenomena, as shown by their absence in the poorest classes in this metropolis. *Dr. PARRY* has seen goitre follow diseases of the heart, and epilepsy. *FLAJANI* has noticed the common occurrence of palpitations and affections of the lungs from the disorder it has occasioned of the respiratory function. When the tumour is very large, or hard, or when it has increased suddenly, it not infrequently occasions most urgent symptoms, by its pressure on the trachea, œsophagus, and jugular veins.

6. As respects the external and internal appear-

ances of this tumour, I may briefly observe that it affects generally the whole gland; but is also sometimes confined to the lateral or to the middle lobes: it is more rarely large on one side than another. At first it is commonly compact, rounded and equal; but, as it increases, it is either soft and flabby to the touch, or unequal, irregular, hard, and obscurely lobulated. It is usually free from pain, and is not discoloured. When it is greatly increased in size, and is soft, it appears pendulous, chiefly owing to its lower parts being most enlarged. When the tumour is divided, the cells of the gland are found, according to HUNTER, BAILLIE, and B. BELL, filled with a more or less viscid fluid; and are of various sizes, generally from that of a pea downwards, not only in different cases, but even in the same gland. In the older, harder, and more irregular forms of the tumour, melicerous, steatomatous, cartilaginous, and ossific deposits have been met with in parts of it, by CELSUS, DE HAEN, FREYTAG, GIRAUD, HEDENUS, and others. The usual state in which this disease presents itself, obviously, is that of an increased secretion into the cells of the gland, distending them more or less; the other changes sometimes observed, being consequences of obscure irritation induced in parts of it during its continuance or growth.

7. II. DIAGNOSIS.—It is necessary to be aware that other diseases of either a more acute or malignant character may affect the thyroid gland and its vicinity, and be mistaken for bronchocele. 1st, The gland may be either healthy, or but little enlarged; the tumour consisting chiefly of thickened surrounding cellular tissue, sometimes containing cysts filled either with a serous, albuminous, or purulent matter. Large *encysted tumours* may also form in the course of the trachea. But these may be readily distinguished by their situation, form, and fluctuation. 2d, The gland itself may be the seat of *chronic or acute inflammation*. In this case the swelling increases more rapidly, but seldom attains a large size; and is generally attended by redness of its surface, and increased temperature. It is also painful, particularly on pressure, and is very hard. I lately saw a case of this description, in a married female of about thirty, who was also seen by Mr. LLOYD, where the inflammation had proceeded to suppuration, and had terminated in an external opening. I believe that inflammation of the gland never occurs but in scrofulous habits. 3d, The gland may also be the seat of *scirrhus*, which may ultimately go on to carcinomatous ulceration; but this is a rare occurrence. In this case the gland is very hard, seldom large, sometimes scarcely increased in bulk, and is the seat of sharp darting pains. It is only met with in persons advanced in age. ALIBERT states, that he has observed a case of goitre pass into cancer; but I doubt the fact; cancer having a very wide and indeterminate signification with this writer. The disease can scarcely be mistaken for aneurism of any of the thyroidal arteries, if any share of attention be directed to the subject. Bronchocele has been considered in the light of a strumous disease — as a form of scrofula. Dr. POSTOLIONE, however, contends that no connection exists between these diseases. As respects the state of morbid action in the gland, the concomitant phenomena, and the respective termin-

ations of both diseases, there is certainly no intimate relation between them.

8. III. TREATMENT.—Previous to the use of iodine in the cure of bronchocele, numerous remedial means were recommended by writers. Of these, the most common were frictions with various liniments; dry rubbing; stimulating and astringent lotions; cold bathing, and cold douches; mercurial applications; plasters with cicuta and ammoniacum, or with ammoniacum and hydrarg.; repeated blistering; leeches applied to the tumour; electricity and galvanism; moxas, issues, and setons; ligature of the arteries supplying the gland; and extirpation of the gland itself. Amongst the internal remedies recommended, I may notice the various preparations of mercury: digitalis combined with camphor (OSIANDER); sulphuret of potassium; chloride of barium (POSTOLIONE); cicuta or belladonna, either alone, or with the chloride of barium; the chloride of calcium; preparations of potash and soda; various mineral springs; the use of sea water, and of distilled water; the ammonio-chloride of iron; burnt sponge, given either alone, or with mercury; and the ashes of the *fucus vesiculosus* (RUSSELL).

9. Of all these, the most celebrated was burnt sponge; and, after the discovery of iodine, this substance, which, having been found by Dr. STRAUB, of Berne, to be contained in official sponge, was recommended by him in 1829, and adopted by Dr. CORNET, of Geneva: and so successful has this medicine proved in the treatment of bronchocele, that, of a hundred and twenty cases treated with it by Dr. MANSON, of Nottingham, seventy-nine were cured, eleven greatly relieved, and two only were not benefited by it. Of several cases of the disease which have come before me since the introduction of this remedy into practice, there has not been one which has not either been cured or remarkably improved by it. I believe, however, that although it has been found the most certainly beneficial of any medicine ever employed in bronchocele, some other practitioners have not derived an equally uniform advantage from its use. I can account for this only by considering that it has been given in too large and irritating doses, or in an improper form; and without due attention having been paid to certain morbid and constitutional relations of the disease during the treatment. The cases of two females who were lately completely cured by the remedy confirm this inference. They had both had the tumour for several years, one for nine years; and had, on former occasions, gone through long courses of iodine, prescribed by judicious and eminent practitioners, but without advantage. When this medicine was ordered by me, it was, therefore, with great difficulty that they were induced to have recourse to it again. It was ordered in very small doses, often repeated, and strict attention was paid to the state of the secretions, and to the uterine functions. In the course of a fortnight an improvement was manifest; and of a few weeks longer, a great decrease of the tumours had taken place. One of these females, a married woman, who had been once pregnant nine years before, upon the disappearance of the tumour came with child; soon after which it somewhat suddenly reappeared, but the resumption of the iodine again dispersed it. The preparations given

in it for a very long period, sometimes without producing much disorder, at other times occasioning the most violent effects. In other cases, in addition to various morbid matters, large balls of worms, both lumbrici and ascarides, collect in this viscus, and occasion much local irritation, or even inflammation of its inner surface, and constitutional disturbance. Mr. BLACKADDER has detailed some interesting instances of this occurrence. He found, in a patient who had complained of disorder of various organs, and of a gnawing soreness in the right iliac region, ragged ulceration of the inner surface of the cæcum, which contained an immense number of worms. The rest of the alimentary canal was sound.

8. B. When the cæcum is much enlarged, or otherwise diseased, it may also be *displaced*. Cases are recorded by SALZMANN and ANNESLEY, in which its attachment to the internal iliac muscle had yielded so far that it had passed over to the left side; and others, in which it had descended very low into the middle of the pelvis, and pressed upon the urinary bladder.

9. Not only may indigestible substances and morbid concretions sometimes lodge in the cæcum, producing much local irritation and general disturbance, but they may, when small, sometimes pass into the vermiform appendage, where they occasion, as will be shown in the sequel, the most dangerous effects. It does not, however, appear that the simple presence of any of these substances in this process is always followed by such results. Mr. BLACKADDER relates a case in which he found a small concretion in this part, and yet the patient had not complained of any symptom referrible to the right iliac region. I have treated, or been consulted respecting, four cases, in which foreign bodies and concretions were found in the appendix after death; and in all, the symptoms were those of the most violent peritonitis complicated with ileus, and terminating in sphacelation of this process itself. Two of these I attended with Mr. PAINTER, of Crawford-street, by whom the inspections were made; and who ascertained that the substance found in the appendix, in one case, consisted chiefly of cholesterine.

10. ii. SYMPTOMS.—The *phenomena* usually occasioned by fecal matters collected in the cæcum, and by distension, enlargement, or irritation of this viscus, will necessarily vary with the nature of the offending substances, the extent to which they may have accumulated, and the age, temperament, and habit of body of the patient. The disorders which result are, 1st, Local; 2d, Symptomatic, and 3d, Constitutional.—a. The *local signs* are more or less fulness, hardness, or distension in the right iliac region: sometimes, on examination carefully with the points of the fingers, the abdominal muscles being relaxed, a doughy hardness is felt. In other cases little or no pain, even upon a minute examination, is complained of; but occasionally, especially if the disorder be about inducing inflammation, both tenderness and pain either exist more or less constantly, or come on in paroxysms; and the patient generally reposes on the right side. When the bowels are constipated, and interruption of the passage of matters through the cæcum occurs, the paroxysms of pain are very acute, and sometimes attended by vomiting, and all the symp-

toms of the most severe colic, or even those of ileus. In such cases, upon examination, signs of obstruction either in the cæcum or in its vicinity are detected, unless general peritonitis may have come on; and then the origin of disease is very generally referred to the cæcal region, or the tenderness and pain are most acute in that situation.

11. b. The *symptomatic disorders*, when this viscus is much distended, either by fecal or other matters, or by flatus, or by both, as is most commonly the case, are, numbness of the right thigh, œdema of the right foot and ankle; sometimes retraction of the testicle, or frequent calls to empty the bladder, and sometimes hæmorrhoids; uneasiness or pain in the right iliac region, often extending to the hypochondrium; various dyspeptic symptoms, costive or irregular state of the bowels; occasionally diarrhoea, with scanty, offensive, and mucous stools; and, if irritation be excited in the mucous surface and follicles of the organ, the efforts made to evacuate the bowels are attended by severe tormina, and even by retching. I have seen several cases of varicose veins of the leg, or indolent ulcers, and a case of disease of the bones of the foot, the occurrence of which was evidently connected with great distension and accumulations in the cæcum; the symptoms of this disorder, with more or less tumefaction and hardness in the iliac region, having been found on examination. The justness of this view was fully shown by the success of the treatment, which was based upon it.

12. c. As long as the states of disorder have not advanced to inflammation or ulceration, the effects are often not very manifest upon the constitution. The countenance and skin, however, are pale and lax; the complexion is deficient of clearness, and, with the surface generally, often covered with an oily or dirty moisture; the perspiration is foetid, and the breath offensive; the soft solids lose their elasticity, and are slightly emaciated; the lips are usually pale, the tongue white or loaded at its centre and base, sometimes red at its point and edges; the pulse is weak, soft, or small, frequently slow, but easily accelerated; and, at an advanced stage, the symptoms more clearly manifest that the blood is imperfectly depurated, or that it is affected by the absorption of a portion of the excrementitious matters retained in the cæcum. In addition to these symptoms, general debility, and disinclination to any physical or mental exertion, are often complained of. The above states of disorder continue for a longer or shorter period; when at last the local irritation either produces increased action of the muscular coat of the cæcum, and ultimately the dislodgment of the offending matters, or gives rise to acute or chronic states of inflammation, and various consecutive organic changes. In some instances, the accumulation in this viscus, and the spasm of the adjoining parts, amount to complete obstruction of the passage through the alimentary canal, even without inflammation or any disorganisation of the cæcum itself having taken place; causing violent colic and ileus, as in the cases already noticed (§ 10.); the most marked symptoms during life being referrible to the superior portions of the tube, and the lesions after death being most remarkable in those parts, particularly about the

termination of the ilium, and the ilio-cæcal valve.

13. iii. TREATMENT. — The intentions in this state of disorder are very obvious; namely, 1st, to evacuate morbid collections; and, 2d, to prevent their re-accumulation, by preserving a regular tonic action of the viscus, and by strengthening the digestive organs generally. — *a.* The evacuation of the accumulated or retained matters is to be attempted by means appropriate to the circumstances of the case. If there exist irritability of stomach, or even any tendency to it, or to febrile action; or if there be any pain or soreness in the iliac region; full doses of calomel should be first exhibited, the enemata about to be suggested administered, and the liniments prescribed in the Appendix (F. 296. 311.) assiduously rubbed over the cæcal region, with the view of exciting the healthy action of the viscus. If, on the other hand, the stomach and bowels be torpid, and the former can retain purgative or cathartic medicines, they may be given, selecting those which are the least irritating in their effects. I have seen inattention to this caution, the most stimulating cathartics having been exhibited, productive of the worst consequences; a state of disorder simply functional, or colic from distension and obstruction of the cæcum, being converted into either inflammation of the bowels or dangerous ileus. When, therefore, an irritable state of the stomach supervenes in our attempts to remove obstructions of this viscus, we should desist from the exhibition of purgatives, or even of aperients by the mouth, excepting full doses of calomel, or calomel combined with hyoscyamus or opium, and moderate doses of nitrate of potash, or carbonate of soda, or of both, which will generally be retained, and will allay the sickness and retchings. But we ought strenuously to persist in the administration of enemata — preferring those which are oleaginous, saponaceous, and solvent — and in the use of the liniments and frictions. The enemata should be always large, and injected by means of the valve-syringe now in use, so that they may reach the seat of obstruction. In obstinate cases, this object will be facilitated by placing the patient upon his knees and elbows during their administration, and elevating the pelvis as much as possible above the rest of the trunk. The practitioner should not be discouraged by the ineffectual administration of several injections, but repeat them according to circumstances, employing at the same time frictions over the abdomen with the liniments already advised. If flatulent distention of the abdomen be present, they will assist in removing it; but in such cases the terebinthinate enemata ought to be preferred. When we suspect the presence of worms, in addition to other morbid matters, aloes and the alkaline solutions, assafoetida, camphor, lime-water, &c. may be used in the injections. In the slighter and more usual cases, the aperients in common use, particularly castor oil, the compound decoction of aloes, the combination of the compound infusions of senna and of gentian, or the infusion of senna with decoction of cinchona, or the several formulæ of this description contained in the Appendix (F. 215. 266. 562. 575.), may be prescribed, as they may appear appropriate to the circumstances of the case.

14. b. Having apparently removed whatever

obstruction may have existed, — the cæcal region being soft and natural, and the actions of the bowels free, — the object is next to prevent the recurrence of disorder, and to strengthen the digestive organs, by vegetable tonics and bitters combined with aperients; by sulphate of quinine with aloes; by small doses of blue pill with the alkaline carbonates and other deobstruents, and given occasionally with the view of promoting and correcting the secretions; by the occasional use of the liniments above referred to, or by wearing a warm stimulating plaster (see F. 109. 115. 117.) over the right inferior regions of the abdomen. In every case, attention should be paid to the state of the digestive, assimilating, and secreting functions; regular evacuations of the bowels promoted, by the occasional use of enemata; and the diet strictly attended to.

II. INFLAMMATION OF THE CÆCUM. CLASSIF.

III. CLASS, I. ORDER (*Author*).

15. Although inflammations of this viscus have been generally overlooked or confounded with those affecting either the colon, the small intestines, or the peritoneum, there are few diseases more defined in their character, or more distinctly limited in the great proportion of the instances of their occurrence, than they are. In respect of its seat, inflammation may affect chiefly the mucous surface, or the follicles, or all the coats of the organ more or less: or it may attack the vermiform appendix only, or the cellular tissue connecting the cæcum to the internal iliac muscle. As to the character of the inflammatory action, it may be sthenic and acute; or acute, asthenic, and spreading, as in dysentery and fever: it may also be more or less chronic. Cases of all these states of disease are to be found scattered through the works of modern medical authors, and most of them have come before me. The first case which attracted my attention to the importance of attending to the state of this viscus in various abdominal diseases, occurred in 1816, in a hot climate. The patient had the usual symptoms of inflammatory dysentery, with violent pain, and subsequently tumefaction in the cæcal region. The disease had been neglected in its early stages; and it was only shortly before the sudden subsidence of this tumour that I observed it. Upon straining at stool, a sensation of something having burst internally was felt; and very soon afterwards above a pint of purulent matter, mixed with a little blood, was discharged. Upon examination six hours after death, the cæcum was found ulcerated, discoloured, and nearly sphacelated, with an opening through the part attached to the abdominal parietes leading to the nearly empty sac of an abscess which had formed in the cellular tissue connecting this viscus to the side; the mucous membrane of the colon was inflamed in parts, and excoriated.

16. i. THE CAUSES of inflammations of the cæcum are chiefly the functional disorders already described. A morbid state of the abdominal secretions, and particularly an increased secretion of vitiated acrid bile; the irritation of foreign bodies, indigestible substances, and of worms; a strangulated hernia, or the pressure of an ill-constructed truss; the suppression of the hæmorrhoidal and menstrual discharges; and the presence of biliary or intestinal concretions, hardened fæces, or the stones of fruits, or their escape into the vermiform

of catarrh either disappears, as in the slighter states of the disorder, with a diminished and thickened secretion, less frequent and less severe fits of coughing, and subsidence of fever, in from four, to seven or nine days; or it affects, in a much shorter period,—sometimes almost from its commencement,—the pharynx, trachea, and large bronchi, producing slight or severe bronchitis; or it terminates in this disease, or in pneumonia, or even in pleuritis. But most commonly, under proper management, it is attended merely by a moderate catarrhal affection of the trachea and bronchi; with fits of coughing, increased mucous expectoration, &c., constituting catarrhal bronchitis. It also sometimes extends down the œsophagus, and affects slightly the stomach, inducing numerous dyspeptic symptoms; and, in persons with an irritable state of the digestive tube, occasionally passing off at last with mucous or serous diarrhoea.

11. III. PROGNOSIS.—In general, catarrh is a very slight ailment, and attended with no danger as respects itself. But, in aged persons, in those disposed to pectoral diseases, particularly those who may have tubercles already formed in the lungs, who have had hæmoptysis, or who are asthmatic, or have experienced attacks of bronchitis, pneumonia, or pleuritis, catarrhal affections require strict attention, as they very often quickly produce, or terminate in, these maladies. In many persons, also, they are very prone to become chronic, either in the form of a chronic *coryza*, with continued irritation, and slight redness of the posterior nares and fauces, and an abundant muco-puriform discharge; or in some one of the states of chronic bronchitis. In the aged, and in those of a phlegmatic temperament, or lax habit of body, catarrh often passes into a chronic bronchial flux, when it has been neglected, or renewed by incautious exposures during the treatment. Children of a lymphatic and flaccid habit of body are very liable to catarrh in the form of *coryza*; and in them it very frequently assumes a chronic form; the thick muco-purulent secretion filling up the nares, and, in infants, preventing them from taking the breast, and rendering them irritable, each attempt at sucking disordering the pulmonary and cerebral circulation in such a manner as even to occasion convulsions. In children also, the *coryza*, when allowed to become chronic, sometimes degenerates into *ozæna*, with ulceration.

12. IV. COMPLICATIONS.—Catarrh very commonly ushers in the febrile exanthemata, particularly measles; and even accompanies them through their course, especially in the form of bronchitis. It is also very liable to appear during convalescence from them. Its connection with rheumatism has already been noticed (§ 3.), both disorders evidently springing from the same causes. Continued fevers, as well as some epidemic visitations of fever, are not infrequently complicated with catarrhal affections. The association of catarrh with biliary and gastric derangements is very common, sometimes in consequence of the disposition to be affected by its causes during biliary disturbance, and occasionally owing to the circumstance of simultaneous disorder of the digestive, cephalic, and respiratory mucous surfaces, having arisen from the impression of the same exciting causes. These complications have

especially characterised the various occurrences of *epidemic catarrh*, which have been observed. (See art. INFLUENZA.)

13. V. The NATURE of CATARRH is deserving of some notice. Many pathologists, particularly those of the modern Parisian school,—the followers of LAENNEC and BROUSSAIS,—consider it an ordinary inflammation of the cephalic mucous membranes, or parts of this tissue which it usually affects. Other pathologists, more especially RICHTER and HILDENBRAND, view it, with stricter propriety, as an inflammation of a specific kind. I believe, although it very often terminates in true inflammation when it extends to the bronchial tubes, that it chiefly consists of a specific irritation of that portion of the mucous surface primarily affected by it, nearly allied to inflammation, and soon followed by, or accompanied with, great increase of the secreting functions of the part; or, in other words, that it is not pure inflammation, but an irritation of a specific or peculiar kind, attended by slightly increased vascularity, afflux of the circulating fluids, and augmented secretion. Since the time that VAN HELMONT ridiculed, in his *Catarrhi Deliramenta*, the opinions then entertained respecting catarrh, enquiries into its nature have been more rational, although, up to the present time, ideas have still continued very vague as to the extent of surface affected by it, many even of modern writers comprising under catarrh, not only bronchitis, but even all affection of mucous surfaces, attended with a copious serous or sero-mucous discharge.

14. One of the most interesting questions connected with this subject, and one which has been agitated by J. P. FRANK and others, is, whether the defluxion is a consequence of the suppression of the cutaneous perspiration, arising out of the irritation which the secretion retained in the circulation produces upon the cephalic and pulmonic mucous surfaces; or of the specific irritation and morbid impression of those parts by the exciting causes of the disease. The former opinion was very generally received by the followers of the humoral pathology; and the latter by HOFFMANN, and subsequently by CULLEN, PINEL, and other disciples of his school. PINEL considered the febrile phenomena merely as symptomatic of the inflamed mucous membrane, discarding the plausible opinion advanced by BOTAL, that whatever of inflammation exists is caused by the acrimony of the catarrhal discharge, and that the local ailment is consecutive of the constitutional disturbance,—a doctrine which is in strict accordance with the description of the disease given by RICHTER, and with the more usual succession of its phenomena. In some cases, however, it is very difficult to determine the priority of the general disturbance, the local ailment being equally early. Upon the whole, I believe it is not proved that the constitutional affection is the consequence of the local, although the former is generally increased in proportion to the severity of the latter; nor does it appear that the defluxion is caused by the suppression of the cutaneous perspiration, even granting that suppression is actually produced,—a position by no means established. I would thence infer that the causes of catarrh affect primarily the organic nerves supplying the surface principally disordered, and, through them, the system generally; and that,

days, the patient complains of rigors, remarkable debility, and frequency of pulse, with sickness at stomach, retchings, &c. A pustule appears in the part, but not always; and generally no connection can be traced between it, even when it is formed, and the diffusive inflammation which takes place during the progress of the constitutional affection. In some cases, a few red lines may be traced, or swelling of the surrounding part is observed; but neither advances any distance, the parts above being perfectly sound. In the course of the violent fever induced by the inoculation in the hand, the consecutive inflammation usually appears in the axilla, and extends towards the sternum, along the neck, down to the loins or haunch, or even to the thigh of the same side. In some instances, it terminates at the mesial line; in others, it passes continuously to the other side. It occasionally is translated from one side or part to the other, by a kind of metastasis, as in gout or erysipelas.

16. The inflammation of the cellular tissue of the trunk, whether arising from a continuous extension of the disease from the arm, or part originally affected, as in certain states of the disease (§ 12, 13.), or in the course of the constitutional commotion (§ 14.) excited by the inoculation of a morbid virus, always possesses peculiar characteristics: it is diffuse or extensive, without the smallest tendency to point; being flatly elevated above the sound parts, usually by a raised or defined margin. It is smooth and equal, without central hardness, and with all the characters already noticed (§ 12.). In general, no chords, which can be supposed to be diseased lymphatics, veins, or arteries, can be traced under the surface, and the glands are either very slightly or not at all enlarged. The diffused swelling commonly furnishes an obscure sense of fluctuation; but, frequently, when punctures have been made into it, little or no discharge has been procured.

17. The pain of the swollen part is most acute in every instance, whether the swelling be in an extremity, or extend along it to the trunk, or commence in the trunk itself; and it is quite independent of whatever affection of the skin may accompany the malady. In some cases, the integuments present not the least redness, although the cellular tissue has extensively suppured, or even sphacelated; but the skin is commonly more or less affected, although in a secondary manner, in consequence of the extension of disease from the cellular tissue to it, and generally subsequently to the manifestation of acute pain. In the advanced stages, the skin has often a reddish or pink coloured blush, and occasionally a mottled or livid hue. In some cases, at a still further advanced period, solitary vesicles form over the diseased cellular tissue, and contain a serous, or sero-sanguineous, or ichorous fluid. The temperature of the part is sometimes much below natural.

18. B. The *febrile commotion*, whether appearing consecutively of the diffuse inflammation, directly produced in the part primarily injured, or previously to the affection of the trunk, is of a typhoid or adynamic type, and is accompanied with the most marked disorder of the nervous system, with anxious collapsed countenance, and frequency of pulse; more particularly when excited by the inoculation of a morbid matter, as by

wounds from dissecting recent subjects, and when preceding the disease of the cellular tissue of the trunk. The fever sometimes commences insidiously, but more frequently in a very evident or tumultuous manner. The pulse soon becomes very quick, sharp, broad, soft, or compressible. The patient lies in the supine posture, with depressed shoulders, and without turning to either side. Delirium is common, but it is generally intermittent; and profound coma is rare. The respiration always is quick, laborious, and painful, partly owing to the inflammation of the cellular tissue of the side of the thorax, and its extension to the costal pleura. As the disease advances, the peculiar cadaverous foetor emitted by the patient, the yellowish or lurid hue of the surface, the offensive and sometimes coloured sweat, which, in rare instances, proves critical, and the tendency to ulceration in the parts pressed by the weight of the body, show that the blood, the secretions, and the soft solids, are more or less contaminated. Towards a fatal close, the raving delirium is often accompanied with muttering, and starting of the tendons; and alternated with stupor; the breathing becoming panting, laborious, or interrupted.

19. The TERMINATIONS of the disease vary with the exciting cause, the state of the patient's constitution, and the part primarily affected. When it arises from mechanical causes, as after venæsection, simple puncture, &c., it may terminate with spreading *suppuration*, which may or may not be attended by *sloughing* of the cellular structure: and this result may occur both in cases which end fatally and in those that recover; a partial regeneration of this tissue taking place in some of the latter. In the milder cases, the inflammatory action changes its character, and shows a tendency to stop; the disease terminating in phlegmonic suppuration and granulation. If the cellular substance adjoining a serous membrane become affected, this latter participates, and the inflammation spreads rapidly over it, generally producing an effusion of sanguineous serum; but sometimes, also, adhesion of the opposite surfaces. Occasionally the adjoining periosteum becomes diseased, and even the cartilages and bones denuded. A fatal termination occurs either rapidly from the intensity of the disease, or more slowly from some one of its sequelæ: and usually takes place, in the first instance, in from four to fourteen days; in the second, not till after two or more weeks, or even longer; but the common period is from the sixth to the tenth day.

20. III. APPEARANCES ON DISSECTION.—Dr. DUNCAN has given a very minute and accurate account of the successive changes that take place in the diseased structure. As the malady often attacks progressively various parts, it is sometimes found after death, in all its stages, in the same subject. In the part last affected, which is frequently the space between the last ribs and the os ilium, the cellular substance is merely oedematous, with increased vascularity; the infiltrated fluid being either limpid or tinged with red, and readily flowing from the divided tissue. In a more advanced stage, the effused matter is less fluid, often higher coloured, but not yet puriform. The diseased structure is next found gorged with a white semifluid matter, which greatly aug-

spasmodic contractions of the alimentary canal, to vomiting and purging, and to spasms of the voluntary muscles, &c.; the bile accumulated in the gall-bladder and hepatic ducts being let loose and thrown into the intestines only subsequently to the seizure, and owing to the vomitings and purgings which usher it in. In some cases, indeed, this irruption of bile is prevented from taking place, until an advanced stage, by spasm of the common duct, extended to it from the duodenum, as more commonly occurs in the third variety of the disorder. When the various causes now referred to combine to produce the disease, particularly in persons of a nervous and irritable temperament, and who have neglected, for a considerable time before, the state of the bowels, and secretions poured into them, it cannot be a matter of surprise, that its symptoms assume the severe form described by SYDENHAM.

10. *Symptoms.* — Bilious cholera, in whatever state it occurs, differs chiefly in its degree of severity. It is chiefly characterised by anxiety, and by painful and violent gripings, evidently proceeding from spasmodic contractions of the alimentary canal, taking the duodenum for their point of departure, and occasioning the continued or frequently repeated rejection of their contents by vomiting and purging. Owing to the anatomical connection of the great sympathetic or ganglial system with the voluntary nerves and other parts of the frame, the spasms extend to the abdominal muscles, and muscles of the lower extremities, — the testes being forcibly retracted to the abdominal ring, — and are accompanied with great pain. The tongue is dry or clammy; thirst is very urgent, and the urine scanty and high coloured. The pulse is at first full and frequent; but, as the disease continues, it becomes smaller, weaker, and more rapid. At more advanced periods, the spasms sometimes extend to the arms and hands. The symptoms often continue with little variation for some hours; but, when the attack is severe, seldom without the patient's strength being greatly reduced; the countenance at last becoming anxious and collapsed; the breathing frequent, interrupted, and laborious, and sometimes with singultus; the pulse feeble, irregular, and intermittent; and the extremities cold or clammy, with leipothymia or fainting.

11. *Duration and Prognosis.* — The cholera of temperate climates is seldom fatal, unless when it is more than usually prevalent, after very rainy and hot seasons. But, when neglected or improperly treated, especially at such times, a fatal issue may occur, but very rarely in less time than twenty-four hours. In milder cases, it may extend to two or three days, and then terminate either favourably or unfavourably, most commonly the former; the vomiting, purging, and spasms subsiding, and entirely ceasing, the pulse becoming slower and fuller, and the countenance resuming its former expression. An unfavourable issue is indicated by a continuance of the purging and vomiting, particularly after substances are taken into the stomach, a hurried, gasping respiration; great frequency, feebleness, irregularity, and intermissions of the pulse; collapse and paleness of the countenance; coldness and pulselessness of the extremities, with anxiety, and frequent faintings, &c. In general, however, even when left to itself, the disease operates

its own cure in the course of some hours; or it continues for one, two, or in milder cases for even three days, and ceases by degrees; the morbid secretions which excited the attack having been evacuated, and the irritation they occasioned having subsided. Although nature may accomplish this without aid, yet the assistance of art is generally required to ensure its attainment. The febrile symptoms attending the early stage of the disease, unless in some instances of its epidemic prevalence, are merely the consequence of the pain, spasms, vomitings, and general commotion of the nervous system, and usually subside immediately these disorders are allayed.

ii. CHOLERA FLATULENTA, *Flatulent Cholera*; *χολέρα ξηρά*, Gr.; *Ch. Sicca*, Lat.

12. *DEFIN.* Vomiting and purging rare, sometimes retchings; gripings and spasms of the abdominal muscles, with great and oppressive flatulence, temporally relieved by eructations, and dejections of flatus.

13. This variety was formed by HIPPOCRATES, continued by SYDENHAM, and, after having been discontinued by the majority of modern writers, who, if they at all remarked it, considered it rather as a form of colic than of cholera, was again distinguished as a species of this latter disease by Dr. GOOD. It is very rarely met with in practice; and generally holds an intermediate rank between flatulent colic and cholera, sometimes approaching more nearly to the former. In none of the very few cases of this description which have come before me (not exceeding two or three), have I observed a natural secretion of bile; but, on the contrary, the liver has evinced signs of great torpor, and the whole digestive organs have been manifestly enfeebled, long protracted dyspepsia and hypochondriasis having existed previous to the attack.

14. This form of the disease is chiefly characterised by spasms of the alimentary canal, apparently excited by acrid, rancid, and indigestible substances; and by an irritating gas, either secreted from the digestive mucous surface, or generated from the decomposition of the imperfectly digested food. (See articles COLIC and FLATULENCY.) The painful and flatulent griping is accompanied with severe spasm of the abdominal muscles, anxiety, occasional retchings, flatulent irritations, and calls to stool, with slight tenesmus, and very scanty, offensive, pale coloured, and watery evacuations, with flatus. Considerable depression of the powers of life, acceleration of pulse, pale, anxious countenance, coldness of the extremities, and sometimes alarming sinking, supervene, when the disease has been neglected.

15. *Causes.* — This rare form of cholera chiefly appears in the debilitated, and those of a melancholic temperament; and is generally excited by a surfeit, by cold drinks when the body is overheated, by the use of cold or unripe fruits, particularly melons, water-melons, cucumbers, unripe plums, mushrooms, and animal poisons, especially the rank parts of bacon, or tongues, sausages, &c. when kept too long, or insufficiently cured; also by unhealthy or stale fish, and by cold or moisture after having been exposed for some time previously to a high range of temperature. The author was very recently the subject of an attack as described above, from having partaken of

the mesenteric glands are often enlarged; the liver is sometimes darker, and generally much larger, than natural; the gall-bladder is occasionally filled with bile; and the spleen is manifestly congested. In a few instances, the intestines have been found more remarkably inflamed, and adherent by means of exudations of lymph on their peritoneal surfaces. In the more protracted cases, effusions of serum are found within the cranium; but, in recent cases, the brain presents little or no morbid appearances beyond slight congestion.

7. *E. Its Nature.*—The symptoms, and the appearances after death, clearly show that this disease consists of inflammatory irritation, often rapidly passing into inflammation of the greater part of the mucous surface of the stomach, and of the small and large intestines; frequently accompanied with depressed vital energy of the frame, congestion of the liver, and a morbid state of the abdominal secretions, and occasioning sympathetic disorder either of the functions or of the substance of the brain and its membranes.

8. II. TREATMENT.—At the commencement of the disease, demulcents may be administered. Dr. RUSH recommends an ipecacuanha emetic; but Dr. DEWEES disapproves of emetics,—an opinion which is agreeable to my experience. I have usually first had recourse, in the slighter cases, either to hydrarg. cum creta or calomel, in frequent doses, and combined with magnesia or soda; or to nitrate of potash with the carbonate of soda, in demulcents; and to the application of leeches on the epigastrium, whenever tenderness of this region could be detected. After a few of these powders have been taken, a dose of calomel, sometimes with a grain of James's powder, has been given at bed-time, and castor oil the following morning: at the same time, oleaginous glysters have been administered, and, as the symptoms abated, those of an emollient kind employed. If the patient be not very young, a few drops of tinct. opii, or a little syrup of poppies, may generally be added to the injection. The warm bath, or the semicupium, should never be omitted in the treatment of this disease, the surface being well rubbed with a coarse towel upon coming out of the bath, and the child afterwards placed in warm blankets. These means, if early resorted to, will generally succeed in the less severe cases occurring in temperate climates. But, in the more intense states of the malady, medicines given by the mouth will not be retained; and such a dose of opium as will not be rejected, may be injurious. In these, it will be preferable to commence with the application of leeches to the epigastrium; and to endeavour to procure more healthy evacuations, and a discharge of bile downwards, by repeated injections, consisting of a solution of common salt (about two or three tea-spoonfuls) in warm water. The frequency of the stools ought not to prevent the administration of the injection; which will generally relieve the vomiting and other symptoms as soon as bilious or faecal evacuations are procured.

9. When the disease appears to be brought on by improper ingesta, the vomiting may be promoted by diluents. But the object should be to quiet the stomach as soon as possible. For this purpose Dr. DEWEES recommends, for very young children, as well as for those who are older, a tea-

every fifteen minutes. Of this treatment I have had no experience. In cases where the more bulky medicines are not retained, the plan of giving minute doses of calomel, adopted by Dr. DEWEES, may be followed. He directs a quarter of a grain of calomel, intimately mixed with half a grain or a grain of sugar, to be placed dry, every hour, upon the child's tongue, until the stools become more copious, less frequent, and of a dark green colour. When this change is effected, the powders are to be given less frequently. After the bowels have been well evacuated, he prescribes an injection in the evening, with a few drops of laudanum, according to the age of the child; and if the disorder is not much abated, he recommences with the calomel powders as above, on the following morning, repeating the injection at night. I have never tried this practice, having found the means recommended in the preceding paragraph (§ 8.), with those about to be noticed, generally successful.

10. In the more acute cases, especially when fever is early developed, and much heat of the abdomen or of the head is complained of, the disease should be viewed as being entirely dependent upon inflammation of the mucous surface of the digestive tube, and affecting the brain sympathetically. In these, leeches must be placed upon the epigastrium, or behind the ears; if applied to the former situation, a succession of warm poultices should follow them, a full dose of calomel, intimately mixed with a little sugar, be exhibited, and, soon afterwards, an oleaginous injection (olive oil or castor oil, or both, in gruel, strained mutton broth, or any other demulcent vehicle) thrown up. If these measures fail of producing the advantage expected, the back, loins, or insides of the thighs, should be rubbed, twice or thrice daily with either of the *liniments* F. 296. 300. 311., particularly upon coming out of the warm-bath, or semicupium, which ought to be employed once or twice daily, and rendered more efficient by adding salt or mustard, or both, to it. The application of blisters for two, three, or four hours, and re-application of them for an equally short time in another place, may be subsequently had recourse to, when the preceding measures do not answer the purpose for which they were directed. In the more severe cases, particularly when the motions are bloody, a mucilaginous draught, with castor oil and two or three drops of laudanum, may be given; and, if it be not retained, an enema, consisting of the same ingredients, may be administered, or any of the enemata contained in the Appendix suited to the circumstances of the case, and proportioned to the age of the patient.

11. In the advanced stage of the disease, especially when it passes into a dysenteric state, and when the exhaustion is great, and the stools are offensive, small doses of the chlorate of lime, or of potash, in an aromatic water, or in mucilaginous draughts or injections, will be very serviceable. In this chronic period, when the disorder lapses into the form of diarrhoea, proceeding from chronic inflammation of the intestinal mucous surface, the following powders may be given alternately with the chlorates, or either before or after they have been tried:—

No. 123. R Hydrarg. cum Creta gr. j.; Magn. Calcin. gr. iij.; Gum. Acaciæ et Sacch. Albi ʒss gr. v.; Tinct.

ful of strong coffee, without sugar or milk,

admitted, that the poison of the tarantula spider is most successfully counteracted by the exciting influence of music on the mind, and the profuse perspirations produced by continued dancing. A writer in the *New York Medical Repository* details an instance of a convulsive disorder occasioned by the bite of a spider, and cured by music. Mr. KINDER WOOD has recorded a case, which originated in disordered menstrual function, with cerebral symptoms and painful affections of the nerves of the face, that resembled in every respect the malady to which the German physicians gave the name of chorea.

20. The disorder, also, which has usually been called the "*Leaping Ague*" in Scotland, seems to be very closely allied to the original chorea. It is described very nearly as follows by a writer in the *Edinburgh Medical and Surgical Journal*:—Those affected first complain of a pain in the head or lower part of the back, to which succeed convulsive fits, or fits of dancing, at certain periods. During the paroxysm they distort their bodies in various ways, and leap about in a surprising manner. Sometimes they run with great velocity even in dangerous places, and when confined, climb or leap from the floors of the cottages to the rafters, or swing by, or whirl around, one of them. They often dance or leap about with greater agility, vigour, and exactness, than they are capable of exerting at other periods; the affection apparently consisting chiefly of a morbid and irresistible propensity to dance, tumble, and run about in a fantastic manner. Cases of this form of disorder have been detailed by TULPIUS, PENADA, REIL, BRÜCKMANN, WESTPHAL, CRICHTON, PIEDAGNEL, LAURENT, and others. In M. PIEDAGNEL's case there was a propensity to run forwards, until the patient, a man, dropped down exhausted. On examining the brain after death, tubercles were found pressing on the anterior part of the hemisphere. A similar instance occurred in the father of a medical friend, and terminated in paralysis. The subject of M. LAURENT's case was propelled backwards with considerable velocity.

21. Dr. WATT has given the history of a disorder, which he has called chorea, or periodical jactitation, in a girl of ten years, that was preceded by excruciating headach and vomiting. To this affection of the head succeeded the propensity to turn around in one direction on her feet with great velocity like a spinning top. This propensity subsided after having continued above a month, but was followed by an exasperated return of the headach, and loss of power over the muscles of the neck. She was afterwards seized by a different kind of motion, occurring in fits, which lasted daily, from two or three, to six or seven hours; this consisted in placing herself across the bed, and rolling rapidly round on her sides from one end of it to the other. When laid in the shallow part of a river she rolled around, although at the point of being drowned. The affusion of cold water did not stop the rotations, which were about sixty in a minute. In a little more than a month these movements were replaced by others of a different kind. She now laid herself on her back, and, drawing her head and heels towards each other, raised her trunk, afterwards falling with some force on her back by straightening her body. These motions were repeated ten or twelve times in a minute, were con-

tinued for about five weeks, and were then followed by the propensity of standing upon her head. Having raised her feet perpendicularly upwards, she fell down as if dead, but instantly placed herself on her head as before, again fell, and continued to repeat these movements for fifteen hours a day, and as rapidly as twelve or fifteen times a minute. The affection had resisted emetics, cathartics, local depletion, blistering, setons, &c., but disappeared after a spontaneous diarrhoea. Dr. WATT refers to two similar cases which had come to his knowledge; and another instance has been adduced by the writer, under the designation of "*Inquirer*," of an instructive article on the subject, in the third volume of the *Edinburgh Medical Journal*. Mr. HUNTER has also given the particulars of an instance of rotatory affection resembling chorea, in the twenty-third volume of the same work.

22. Dr. ROBERTSON has described a peculiar form of convulsion, in many respects like chorea, which spread at one time (1800) as an epidemic amongst a sect of religious enthusiasts in the states of Tennessee and Kentucky, evidently from the influence of imagination and irritation on morbidly excited minds. The seizure was violent, and distinctly convulsive at the commencement, but it usually passed from this state into one more chronic, and more nearly approaching chorea. Persons thus affected are described by Dr. ROBERTSON as being continually interrupted in their conversation by the irregular contractions of the muscles, and as having no command over these contractions by any effort of volition; lying down in bed does not prevent them, but they always cease during sleep. Remissions and exacerbations are common, but occur without regularity. During the remission, a paroxysm is often excited by the sight of an affected person, but more frequently by shaking hands with him. The sensations of the patient during the fit are said to be agreeable, and are expressed by the enthusiastic by laughing, shouting, dancing, &c., followed by fatigue, and a sense of general soreness. The affection at last becomes slighter by degrees, and finally disappears. Cases of similar nervous disorders, and apparently intermediate between chorea and convulsions, and often partaking of many of the features of hysteria, as well as the affection called *Malleatio*, have been detailed by TULPIUS, HORSTIUS, MORGAGNI, WICHMANN, MAJENDIE, and others above referred to (§ 20.). It is difficult to believe, however, upon perusing the particulars of the foregoing cases, that they are altogether the actual phenomena of disease. It is very probable that the morbid affection of mind,—the disordered state of the desires, or of the mental impressions,—exalts the derangement of the nervous system to that singular pitch, of which these cases are rare examples. (See arts. CONVULSIONS, and HYSTERIA.)

23. VI. TREATMENT.—A. *Conspectus of the treatment.*—Purgatives have been recommended in chorea by SYDENHAM, WHYTT, HAMILTON, CHEYNE, and others. SYDENHAM, however, did not confide the cure of this affection to them entirely, for he also directed occasional depletion, with tonics in the days intervening between the exhibition of the purgatives, and narcotics at bedtime. *Emmenagogues*, particularly aloës, myrrh, asafoetida, hellebore, savine, castor, the melissa

in which the suppression of the rheumatic affection of the joints by the use of embrocations and liniments was rapidly succeeded by the appearance of internal disease, the application of such remedies to the external seat of the rheumatic disorder should not be resorted to.

36. In the *irregular forms* of chorea, particularly those which present more or less of an hysterical character, the functions of the uterus, and the circulation of the brain or spinal chord, or both, are often disordered. In these it will be requisite not only to evacuate the bowels freely, but also to allay uterine irritation, where it seems to exist, by leeches applied to the tops of the thighs, or cupping over the sacrum, and to promote the monthly evacuation, when scanty or retained, by purgatives and emmenagogues. In many cases of this description, the application of a number of leeches to the occiput, neck, and behind the ears, the cold affusion on the head, or the shower bath, with warm clothing on the lower part of the body, and due regulation of the moral emotions, will materially aid the treatment. The more the attack assumes the characters of tonic convulsion, the more requisite will it in general be to have recourse to local depletions, especially if the affection occur after puberty, and be connected with interrupted menstruation.

37. During convalescence, and even in the advanced course of treatment, change of air, agreeable amusement, exercise in the open air, [the use of chalybeate or aperient mineral waters, and a light nutritious diet, commencing with warm salt water bathing during the treatment, and concluding with cold salt water bathing in advanced convalescence, followed by smart frictions of the surface of the body upon coming out of the bath, will materially promote and confirm recovery, as well as prevent a return of the disease.

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CLIMACTERIC DECAY. — Climacteric Disease.

CLASSIF. 3. Class. 4. Order (Good). I. CLASS. V. ORDER (Author).

1. DEFIN. — *General decline of the vital powers, at the age of senescence, without any evident cause.*

2. The ancients believed that very important changes took place in the economy at certain periods; the first being the seventh year, and the subsequent epochs answering to the numbers resulting from the multiplication of three, seven, and nine, into each other: as the twenty-first, the forty-ninth, the sixty-third, and the eighty-first years. The two last were called grand climacteries, as the life of man was supposed to have reached its allotted term. The doctrine of climacteric periods has been traced to PYTHAGORAS, who derived it from the Egyptians; and, although its truth has been denied by many eminent physicians, it has been believed in by others. The changes which take place at these epochs are of two opposite kinds; that of renovation, and that of decay. It is the latter of these which will be here considered.

3. I. SYMPTOMS. — This disease has been very minutely described by Sir H. HALLARD. It usually comes on insensibly. The patient first complains of fatigue upon slight exertion; his appetite becomes impaired; his nights are disturbed or sleepless, and his mornings unrefreshed. The tongue is somewhat white; the pulse a little accelerated; the face extenuated, occasionally slightly bloated; the body emaciated, and the ankles and legs disposed to swell. The urine is not deficient, but the bowels are sluggish, and pains, with vertigo, are occasionally felt shooting through his head and various parts of the body, but are not possessed of the rheumatic character. As the vital exhaustion proceeds, the stomach loses all its powers; the emaciation is greater; the lower limbs are more oedematous; restlessness through the day and sleeplessness through the night, increase, and all the vital manifestations,

the organ affected, can be attended with no danger, particularly when the inflammation is acute, and chiefly attacks serous surfaces; and it may be in some instances productive of benefit; but we are still in want of faithfully observed facts to illustrate the effects of this treatment in a satisfactory manner. In hæmorrhagic affections, a judicious use of cold is often of great service—as the cold affusion or aspersion, the shower-bath, and cold sponging, in epistaxis and hæmoptysis; iced fluids taken into the stomach in hæmatemesis; enemata, and injections per vaginam, of cold liquids, in hæmorrhage from the bowels, menorrhagia, and flooding after delivery. Dr. DRAKE, of New York, has recently recommended very cold air to be respired in inflammations of the respiratory organs; but, from the admitted influence of cold air in increasing the activity of the respiratory functions, and, consequently, the phlogistic disposition of the circulation, it appears to me a practice of doubtful efficacy.

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COLIC.—DER. AND SYN. from κῶλον, *Colm.* κῶλικὸν ἄλγος, Gr. *Colica, Passio Colica, Dolor Colicus, Enteralgia, Colicodynia, Tormina*, Auct. Var. *Colique*, Fr. *Das Bauchgrimmen, die Kolik*, Germ. *Dolori Colici*, Ital. *Belly-Ach*, Eng.

CLASSIF. 1. Class, Nervous Diseases;
3. Order, Spasmodic Affections (Cullen).

1. Class, Diseases of Digestion; 1. Order, Affecting the Alimentary Canal (Gard).

I. CLASS, I. ORDER (Author, in Preface).

1. DEFIN. Severe griping pains in the bowels, with costiveness, and often with vomiting.

2. Colic was formerly considered as seated

chiefly, if not entirely, in the colon; but many writers of the last three centuries have applied the term to acute pains of the bowels, attended by costiveness, and unaccompanied by fever, arising either from a primary affection of them, or from disease of some other viscus in their immediate vicinity, with which they are connected, and often sympathetically affected, through the medium of the ganglial nerves.

3. The first mention made of the disease, by the denomination *Colicus Dolor*, is to be found in CÆLUS and PLINY; and, according to SENNET and TRONCHIN, the same name was used by THEMISON and PHILON, physicians of the Augustine age, when, as SPRENGEL justly supposes, colic must, from the manners of that period, have been a common complaint. But, although the term colic appears not to have been in use, it cannot be supposed that such affections were before unknown. It is more probable that they were included under the general appellation of abdominal pains, in use from the time of Hippocrates. The greater number of modern writers have divided the disease into certain species of varieties, according to the presumed nature of its exciting causes and pathological states. SAUVAGES presents us, accordingly, with no less than 22 varieties. Dr. CULLEN arranges the idiopathic states of the colic into, 1st, The Spasmodic, either with stercoraceous vomiting, or with inflammation superadded; 2d, The Colic of Poitou; 3d, Colic from continued constipation; 4th, From acrid matters in the bowels; 5th, From retention of the meconium; 6th, From stricture of the bowels; and, 7th, From the obstruction occasioned by calculous formations. Dr. GOOD adopts a nearly similar division to the foregoing, preserving the 1st, 2d, 3d, and 6th varieties; and substituting for the others, Colic from Sarset, and Colic from the generation of Flatulence—C. *Cibaria* and C. *Flatulenta*. M. PANISER gives the following varieties:—the flatulent; the stercoraceous; the bilious; the inflammatory; the hæmorrhoidal; the menstrual; the spasmodic; the metastatic; from calculous and other hard bodies; the verminous; from organic changes in the bowels; and from lead. M. CHOMEL divides the disease into nearly the same varieties, and adds to them that arising from acerb or acid fruits, and fermented liquors, or *Colique Végétale*. The only additional arrangement of the forms of colic, which deserves being noticed, has been given by SCHMIDTMANN, as follows:—A. Inflammatory colic; B. Sanguineous or plethoric colic; C. From substances passing through or lodged in the bowels; D. From the metastasis or repression of other diseases; E. Flatulent colic; and F. Nervous colic. Each of these comprises several varieties, according to the exciting and proximate causes.

4. Colic, according to the extended acceptation of the word, arises from so many causes, and presents so many morbid relations, that a satisfactory arrangement of its different states is by no means an easy matter. I shall, however, attempt to group into distinct species those forms of the disease which resemble each other most nearly, or which arise from intimately related causes, noticing the peculiarities or modifications presented by the principal varieties. Those forms of colic which chiefly, or more immediately, depend upon a morbid state of the

it will either be independent of any marked distension of the abdomen, or it will be attended with tension and fulness, anxiety, a dark or dusky appearance about the eyes and mouth, and with thirst. Under these circumstances especially, and in the more severe attacks, particularly in the spasmodic, occurring in persons previously in health, *blood-letting* should not be omitted; and even in doubtful cases, blood may be taken either from the arm, or from the abdomen by cupping or leeches, followed by fomentations and poultices, — if there be tumefaction, by the warm turpentine fomentation and injection. Heating carminatives and antispasmodics will be injurious in all such cases, whether vomiting be present or not; and too active endeavours to procure alvine evacuations by means of purgatives given by the mouth may increase the disorder. I have derived more advantage in these cases from small and repeated doses of the carbonate of soda, or the biborate of soda, with nitre, in camphor mixture or some aromatic water — from the use of enemata and gentle frictions of the surface of the abdomen with a rubefacient liniment (F. 311. 313.) — than from purgatives. In a few cases I have given the hydrocyanic acid, either in full doses of the oleum ricini, or in the oleum amygdal. dulcis. When judiciously prescribed, this powerful sedative has a most beneficial effect in restoring the digestive functions after the attack is removed. The hydrargyrum cum creta, or the blue pill, with taraxacum, hyoscyamus, or extract of hop, may also be given after the action of the bowels is restored.

55. *B. Treatment of colic from injurious ingesta, &c.* (§ 10.) — *a.* The state of disorder proceeding from cold acid beverages will generally be soon removed by antacids, combined with narcotics, as ammonia, soda, magnesia, &c. given with opium, or hyoscyamus, and with cordials or carminatives (F. 179. 347, 348.); enemata and frictions of the abdomen, as already recommended (§ 51.) may be also employed, according to the circumstances of the case. — *b.* When the affection is occasioned by cold, acerb, or indigestible fruit or food, it will generally be necessary to commence the treatment by an active warm emetic; and afterwards cordials, cardiacs, and enemata (§ 51, 52.), may be prescribed. — *c.* If the complaint be produced by fish, Cayenne pepper is an almost unfailing antidote. — *d.* If it be occasioned by smoked or tainted meat, or other esculents that have disagreed with the digestive organs, emetics, and afterwards cordials, warm aromatics, and stimulating clysters, with frictions of the abdomen, are among the most successful means. — *e.* Colic sometimes is a consequence of indigestion, and of acidity or sordes in the digestive tube, often occasioned by too much or indigestible food; it then requires a combination of antacids with aperients or purgatives, as the compound decoction of aloes, or the compound infusions of gentian and senna, with soda and ammonia. After the urgent symptoms are removed, the digestive functions should be strengthened and promoted by gentle tonics and deobstruent laxatives (F. 214. 218. 362. 872.). RICHTER recommends for this purpose equal parts of assafoetida and the *fel tauri inspissatum*, especially in the form of the complaint proceeding from acidity.

56. The colic of infants has been stated to

proceed chiefly from acidity of the *prima via* occasioned by the quality or quantity of the ingesta (§ 15.). The carbonates of the alkalies, magnesia, and the preparations of chalk or lime, with carminatives and cordials, are therefore required. (See F. 616 633.). A combination of magnesia with the oxide of zinc is prescribed by RICHTER. Magnesia, soda, or ammonia, in the aqua foeniculi dulcis or aq. anisi, and afterwards a dose of fresh castor oil; the semicupium, and, if it be requisite, an emollient or oleaginous enema, to which a little extractum rutæ, oleum anisi, or tinctura assafoetidæ, has been added, will generally remove all disorder. If, however, these do not soon give relief, the enema should be repeated, and the abdomen rubbed with an antispasmodic liniment (§ 51, R. 135.). If the complaint occur about the period of dentition, the gums ought to be examined, and scarified, if any fulness or redness be remarked in them. If these means fail, those recommended in the section on *volvulus* (§ 77. et seq.) must be put in practice.

57. *C. Treatment of colic from morbid secretions, &c.* — *a.* The colic occurring in new-born infants, from retention of the meconium, is generally soon removed by a dose of castor oil; and, if it fail, by an oleaginous clyster, or by one containing a tea-spoonful of honey and another of common salt, assisted by the semicupium, and the means stated above (§ 56.). — *b.* Colic from accumulation of fecal matters (§ 19.), or from constipation of the bowels, obviously requires purgatives and oleaginous or saponaceous injections. STOUT prescribed emetics in this form of the complaint, and was followed in the practice by SIMS and HOSACK; RIVERIUS gave rhubarb and the turpentine; and BAGLIVI and SYDENHAM advised cathartics and anodynes in oleaginous emulsions. The preparations of sulphur, in doses sufficient to act on the bowels, have been praised by AGRICOLA and RAVE; and frictions and bandages of the abdomen have been recommended by many eminent writers. In this form of the disease, more advantages will be obtained from the repeated exhibition of medicines of a simply relaxing operation (see F. 82. 96. 430.), assisted by large oleaginous and saponaceous injections in the manner recommended by Dr. MAXWELL (see § 77.), than by cathartics, which may irritate or inflame the upper parts of the digestive canal, before they can reach or affect the parts where obstruction exists. Spirits of turpentine, with olive or castor oil, when perfectly diffused and suspended in a suitable vehicle, are extremely efficacious in this state of disorder. An ounce of the spirits, with two or three of either of these oils, in about sixteen or twenty-four ounces of a mucilaginous decoction, should be slowly but steadily thrown up by means of the enema apparatus, the pipe of which may be provided with a guard, to prevent the regurgitation of the fluid. In order to facilitate the passage of this enema along the colon, the patient may be placed in bed, with the pelvis considerably elevated, and friction of the abdomen may be employed during and after the injection of it. If there be no nausea, the following may be taken, and repeated in six or eight hours, if it be requisite: —

No. 136. R. Potassæ Bitart. in pulv. ʒjss. — ʒij. Mar-

marks, it should be frequently repeated, and its effects carefully watched. Although the infusion of tobacco has been chosen for injection by VICAT, FOWLER, CAMPET, CONRADI, HUFELAND, and ABERCROMBIE, yet I agree with SYDENHAM, DE HAEN, SAGAR, QUARIN, and many others, in considering the smoke superior to the infusion; the former being adopted by some merely on account of the greater facility of conveying it into the bowels, and without reference to the very different operation of these two modes of employing this powerful medicine. But in cases where inflation by air or tobacco smoke is adopted, purgative injections should speedily follow, as directed by HIPPOCRATES, if evacuations have not taken place; for the smoke may even pass out by the mouth, and yet copious motions may not otherwise be procured. Besides these means, yeast has been administered as an injection in warm small beer, with the intention of evolving its fixed air in the bowels, and thereby extricating any unnatural convulsion or slight invagination that may have been formed. Sulphuric æther has likewise been thrown into the large bowels, with the expectation that its fumes would operate in a similar manner. Antimonial wine, and the powder or infusion of ipecacuanha have been prescribed in enemata, with the view of relaxing spasm, in cases where it is presumed to be the chief cause of obstruction; whilst the infusion of poppies and of chamomile flowers, various anodyne, saponaceous, laxative, and oleaginous injections (§ 57. 66.), have also been directed with the views already stated.

78. *f. Baths, &c.*—*Tepid* or warm baths are sometimes useful adjuvants in the early stages of the disease, and are generally recommended. Cold fluids taken into the stomach, and thrown into the large bowels, in considerable quantities, and cold epithems constantly applied on the abdomen, have been prescribed by BUREAU*, MARET, RANOE, STEIDEL, DARWIN, CONRADI, BALDINGER, SMITH, and ABERCROMBIE. The dashing of cold water over the lower extremities and abdomen of the patient, whilst he is kept in a standing posture, has likewise been directed by several physicians; but this practice, although occasionally of service, seems less successful than the judicious application of cold to the surface of the abdomen itself. When this cavity is distended, tense, painful on pressure, particularly in a circumscribed portion, with increased temperature of its surface, the cold douche, or the application of cloths moistened with vinegar and water, will often prove of advantage. Dr. BRANDIS, of Copenhagen, states that he has employed iced drinks, and cloths wetted with iced water to the abdomen, in ten cases with success; and that in some instances the practice requires to be persevered in for a long time, and assisted by antispasmodic and laxative enemata, and by opiates with stimulants and tonics taken internally.

79. *g.* When signs of depression of the vital energy manifest themselves in the advanced stage of the disease, stimulants are required, and, if judiciously selected and combined, their exhibition

will sometimes be rapidly followed by amendment. Wherever the lowering measures already noticed are followed by increase of the symptoms, particularly vomiting and restlessness, or by sinking of the nervous power or of animal heat on the surface of the trunk, antispasmodic stimulants and tonics should be conjoined, according to circumstances, with certain of the measures described above. Purgative tinctures are sometimes of service in this state, particularly the tinctures of aloes, with liquor potassæ, and tinct. hyoscyami; and the compound tincture of senna, with tinct. ammon. comp. and spirit. anisi, in large or often repeated doses. Notwithstanding constant or even feculent vomiting in this stage, advantage will sometimes be derived from a full dose of unrectified oil of turpentine (from 3 iv.—x.), taken on the surface of aqua pimentæ, to which either spirit. anisi, tinct. cardamom. co., or tinct. capsici, has been added. I have seen the vomiting cease, and the distension of the abdomen rapidly subside, immediately after this draught, which should be repeated if the former has been thrown off. A full dose of common oil of turpentine, taken by the mouth, has a singular effect in constricting, and, as it were, drawing the small intestines close to the root of the mesentery; so that, in cases where I have given it, and in which hernia had chanced to exist, the hernial sac has become quite empty soon after its exhibition. May not the advantage obtained by it occasionally arise from the disentanglement of a constricted or imprisoned portion of intestine by this mode of operation, as well as from its influence in restoring the action of the paralysed and dilated coats of the bowel in other cases? In many states of inflammatory action, particularly those attended with exhausted tone of the capillaries and depressed vital power, it is one of the most active means we possess of preventing gangrene or effusion, and of restoring the natural action of the vessels.

80. *h.* In some cases, after depletions have been carried far, or in nervous and irritable habits, the inverted action of the stomach and upper part of the alimentary canal appears to continue in consequence of the vital exhaustion and irritability of parts; but if these states were put a stop to for a while, and the powers of life supported, the natural action of the bowels—respecting the immediate restoration of which the patient is often injuriously harassed—would generally at last return. Under such circumstances, pills consisting of the trisnitrate of bismuth, camphor, and opium, frequently repeated; or of the first of these, and extract of hop, or of henbane, or the hydrocyanic acid, in the recent oleum amygdal. dulcis, or oleum olivæ, in moderate but rather frequent doses, and occasionally with an aromatic spirit or distilled water; will often prove of service, particularly when aided by the external means about to be recommended. When thus exhibited, the hydrocyanic acid has a restorative effect; and it is still further beneficial when associated with suitable stimulants, as camphor, æther, &c. In a few instances I have inferred from the situation of the pain, and other symptoms, that the disorder originated in the duodenum or jejunum; and in these especially, the trisnitrate of bismuth and the hydrocyanic acid have been of considerable benefit. The compound tincture of

* Mr. BUREAU recommends the use, and gives a plate descriptive, of a simple hydraulic apparatus for injections, the same in all respects as one lately introduced into this country from France, under the name of clysmaduct, but which is suited only to the injection of water.

lation through the portal vessels, and the consequent fits of colic, being both relieved by the consecutive hæmorrhage from the hæmorrhoidal veins and mucous surface of the rectum. In almost all such cases, in addition to the congestion and associated disorder of the assistant chylipoietic viscera, there are more or less vascular plethora, impeded secretion generally, and deficient energy of the organic nervous system, — a complicated state of disorder evidently requiring local depletions from the region of the liver, or, as Continental practitioners very reasonably prefer, from the vicinity of the anus, with the remedies above stated, and assisted by regular exercise, gentle tonics, aperients, and a regulated diet and regimen. From this it will not appear singular that very dangerous attacks of colic, or even of ileus, will sometimes occur after the operation for hæmorrhoids or anal fistulæ, or other morbid states of the rectum, when performed, as they sometimes are, without previous medical treatment of a kind appropriate to the state of internal disease. — c. The complication of colic with either acute or chronic jaundice is evidently referrible, either to the passage of gall-stones (§ 86.), or to the pathological state of the liver now noticed, or to inflammatory action in the duodenum or biliary ducts, or, lastly, to congestion of bile in the hepatic ducts, or in the gall-bladder. When symptoms of local plethora or congestion can be detected, cupping, and the rest of the treatment now directed, will be serviceable. (See JAUNDICE—Treatment of.)

91. F. When the colic arises from atonic, misplaced, or erratic gout, large doses of the carbonates of the alkalies, or magnesia, with camphor or ammonia, are required, followed by blood-letting, if the pulse, habit of body, and strength of the patient admit of it; by calomel, with camphor and hyoscyamus, or opium, at bed-time; by active cathartics, conjoined with stimulants and restoratives, as long as the alvine evacuations indicate the propriety of their exhibition; by purgative and antispasmodic injections, and by rubefacients and sinapisms to the lower extremities. After morbid secretions and retained feces are evacuated, colchicum may then be given with ammonia, or with camphor and magnesia. But *arthritic colic* occurs most frequently in aged persons, or in those with exhausted constitutions, in whom, instead of evacuations, beyond the expulsion of morbid secretions, active stimulants, — as large doses of camphor and ammonia, or of guaiacum and ammonia, — with warm spices, Cayenne pepper, and sometimes combined with opium or aconitum, and assisted by sinapisms, are indispensably requisite.

92. G. If colic supervene on the disappearance or suppression of *rheumatism* from the joints or aponeuroses, or on the repulsion of *chronic eruptions*, local depletions, followed by camphorated liniments and fomentations; warm turpentine epithems applied on the abdomen; calomel, with antimonial preparations, or with ipecacuanha and opium; warm vapour and fumigating baths; the carbonates of the alkalies, sulphur, the compound decoction of sarsaparilla, or the decoction of dulcamara; blisters, plasters, or ointments, with the potassic-tartrate of antimony, saponaceous and oleaginous enemata; and sinapisms to the extremities or parts primarily affected; constitute the

chief means of cure. The frequency, and, in two of the forms of the disease especially, the danger, of the complaint now discussed, have induced me to be more circumstantial in the account of its pathology and treatment than may appear requisite to many: but I am convinced that the experienced practitioner will not be of the number; but will find cause to regret, with myself, upon reviewing his knowledge, that his information on the subject is not greater than his means of observation have yet afforded him, or my labours can possibly assist him in obtaining.

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Those who wish to be acquainted more fully with the opinions of the writers of the fifteenth, sixteenth, and seventeenth centuries, as to *Ileus* and *Colic*, will find them detailed at considerable length in *BONET's Polyalthes*, &c. fol. vol. i. p. 500. et seq.; in his *Mercurius*, fol. p. 115.; and in *MANGET's Bibliotheca Medico Practica*, fol. vol. i. p. 575. Although I have not availed myself of these collections in any way, owing to my circumscribed limits, and desire to give more precise information of a later date, and more in accordance with my experience, than that which they furnish, yet will they be found to contain much of what has been considered of much more modern date, and, when sifted from the refuse, of no mean value.

The *Bibliography* of these diseases in *Ploucquet's Med. Digesta*, is brought down to the commencement of this century; but many of the references are inaccurate: that by *YOUNG* is very scanty, and not select. The list appended to the art. *Ileus*, in the great French Dictionary, is entirely a catalogue of *Theses* on the subject, of no value; instead of consisting, as it ought, of references to the experience of the best practical writers.

COLON.—*SYN.* *Κολον*. *Der Grimmdarm*, Ger. *The Large Bowel*.

1. The colon is very often the seat of disease, the rest of the alimentary canal being but lightly affected. In some complaints, as constipation, colic, and dysentery, it is the part principally disordered; and in others, as indigestion, diarrhæa, ileus, peritonitis, &c., it participates in the disease with the rest of the digestive organs. The investigation, therefore, of these maladies necessarily includes the consideration of the chief morbid states of this viscus. But there are other derangements which require a brief notice at this place, and which do not belong to these diseases, or to those changes of structure that are common to it and the rest of the alimentary canal, and are considered in the article on the *Pathology of the Digestive Canal*.

I. TORPOR OR ATONY OF THE COLON, AND ITS CONSEQUENCES.—CLASSIF.—I. CLASS, I. ORDER (*Author*).

2. DEFIN. General debility, with indigestion; slow or irregular state of the bowels; distension, borborygmi, or stridulous noises, in the course of the colon; frequently pain or uneasiness, sometimes with tumours in some part of this viscus.

3. i. ITS PATHOLOGY.—Atony and distension of the colon may be variously associated with other disorders. They obtain more or less in all cases of constipation and colic which depend not upon inflammation, or upon diminution or constriction of the canal of the intestines; and they are also often complicated with torpor of the liver, and deficient secretion from the internal surface of the colon. Distension is usually occasioned by flatus or fæcal matters: and it may produce little or no inconvenience, beyond constipation, until it reaches a great extent; but it frequently gives rise to flatulent and stercoraceous colic, and even to ileus. The gases found in the colon are azote, carbonic acid gas, and carburetted hydrogen, in varying proportions; and when they accumulate largely, they always produce borborygmi or an unpleasant or painful sense of distension, and constipation or colic. A. Flatulent distension of the colon (see FLATULENCE) is commonly dependent upon want of vital tone of the digestive organs generally, and of this viscus particularly. In irritation or inflammation of the bowels, flatus is also generated in great quantity; but it is usually expelled quickly, especially when they are unobstructed, owing to reaction of their muscular coats. Much doubt exists as to the source whence this flatus proceeds. The circumstance of its rapid reproduction after its evacuation, when the bowels contain no substances which could give rise to it, and various physiological considerations, lead me to infer that it is in great measure exhaled from the digestive mucous surface; the gases consisting chiefly of those which pass into, or are formed by, the blood; and which, in health, are afterwards given out from it, on the mucous surface of the lungs. Persons who often expel the flatus from the lower bowels, where it evidently is destined to perform useful purposes

in the economy, are most subject to an atonic state of the colon, and to a continued as well as an increased generation of the intestinal gases: and, when circumstances prevent the accustomed frequency of their discharge, are most liable to experience the effects of their accumulation. Atonic distension of the colon by flatus is also a common attendant upon congestion of some one or more of the abdominal viscera, and even upon general vascular plethora, particularly when it oppresses the circulating energies. It also often accompanies hysteria: and, owing to the increased sensibility of the organic nerves, as well as to the morbid irritability and irregular action of the muscular fibres of the bowels, gives rise to various painful sensations in their course, and to anomalous states of disorder.

4. B. When an atonic and flatulent state of the colon is associated with morbid irritability of the muscular coat, painful sensations in some part of the course of this viscus are frequently complained of, particularly by females; and are by them often referred to its left arch and descending portion; and are attended by loud croaking or stridulous noises, especially upon full respiration and mental emotion. The bowels are usually constipated, and attempts at evacuation are accompanied with slight tenesmus, the stools being discoloured, hard, slimy, or in lumps. The abdomen is tumid; and tenderness, often shifting its place, and varying in degree or duration, is sometimes felt. The whole digestive organs necessarily participate in this state of disorder, and perform their functions imperfectly. The nervous system of organic life acquires increased sensibility; the cerebro-spinal system becomes morbidly susceptible of impressions, particularly in females; the countenance is pale, slightly discoloured, and often covered by an oily moisture; the tongue is loaded, flabby, sometimes large, presenting fissures on its surface, and the impressions of the teeth on its edges; the pulse is weak and soft; and a sense of distension and oppression follows a full meal. This state of disorder is very frequent in young females, who take not sufficient exercise; and, when neglected, is often the forerunner of more serious ailments, both of the bowels and of the generative organs.

5. C. Deficient vital energy of the colon also gives rise to *relaxation or irregular action* of its coats, to constipation, and to collections of *fecal matters*, generally with more or less flatulence. *Fecal accumulations* to a great amount is most commonly met with in aged females, or persons far advanced in life, who have injured the tone of the bowel by the frequent use of cathartics, and have passed a sedentary and luxurious existence. They also occur, but to a much less extent, in children and young persons, especially females from the ninth to the eighteenth year of age, and even upwards. Sometimes they occasion large tumours, particularly in the cæcum and sigmoid flexure, but occasionally also in the transverse arch and other parts of the colon. When distension proceeds from retained *fecal matters*, in additions to the local signs observed on careful examination and percussion of the abdomen in the course of this bowel, numerous symptomatic ailments are complained of. These vary but little from those described above (§ 4.), and in the article treating of accumulations in the

Cæcum (§11.). The countenance and skin are generally foul, unhealthy, and devoid of animation; the perspiration is thick, clammy, foetid, and oleaginous; the breath very offensive; the tongue loaded or furred; the lips and gums are pale; muscular energy is much diminished; the appetite imperfect or capricious; digestion difficult; headach or vertigo is often present; the abdomen is tumid, doughy, and inelastic; the urine is loaded; the bowels are either constipated or irregular, or, if daily evacuations take place, the motions are slimy, very dark, or otherwise discoloured, scanty, and offensive; and the pulse soft, weak, often slow, but afterwards accelerated. In many cases, pains in the loins, abdomen, and limbs are complained of, with mental inactivity, general lassitude, œdema of the lower extremities, flabby inelastic state of the soft solids, leipothymia, or fainting, upon quickly assuming the erect posture, and occasional fits of sinking, especially in females.

6. Although torpor of the colon is most frequently followed by *fecal accumulations* and distension, yet these are neither constant nor necessary results of this state, at least to any very manifest extent; for *sordes* and *fecal collections* may be very injurious to the mucous surface, without proving so from their bulk or mechanical effects only. Indeed they are often noxious from their acrimony, without occasioning remarkable distension, or any degree of obstruction, particularly when the vital energies are depressed. Their presence, therefore, should be inferred rather from various remote symptoms than from those which are referrible to the colon itself. But whenever disorder of remote organs leads us to suspect torpor of this bowel, the practitioner should make an accurate examination of all the abdominal regions, commencing with that of the cæcum, following the course of the colon between the ilium and right ribs, below the epigastrium and under both hypochondria, to the left side and iliac fossa, and to the hypogastrium. If a sensation of doughy fulness be felt by the examiner, in any part of its course, the internal surface of the bowel is probably lined with *sordes* and accumulated secretions which its vital energy has not been sufficient to throw off. If hardness be felt, with more or less tumour, *fecal collections* are most likely formed. But the evidence furnished by this examination should not satisfy us: we should inquire after the symptoms stated above, particularly the foul or clammy tongue, foetor of the breath, unnatural state of the countenance, and cutaneous surface, and the offensive and morbid evacuations usually attendant upon this ailment. A belief is too generally entertained, that *fecal matters* and *sordes* will not accumulate in the colon, unless the patient has been constipated. But they may collect in its cells, the more central part of the canal allowing daily evacuations; and they may even remain there for a considerable period, producing much irritation, and even a relaxed state of the bowels; thereby misleading the judgment of the practitioner as to the pathological state constituting the disorder. How, therefore, is he to form an accurate opinion? By a careful examination of the abdomen in the course of the colon, of the urine, of the stools, and of all the organic and animal functions, and by ascertaining the presence

gestions and effusions of serum on the brain and its membranes, supervene as the more remote effects. — c. Fæcal or flatulent accumulations in the colon affect, in a very evident manner, the functions of the small intestines and stomach, or increase disorder in these viscera, when it previously exists,—a circumstance of frequent occurrence, the function of digestion being equally impeded with that of defæcation, and owing to the same primary pathological state, namely, imperfect manifestation of vital power throughout the organic nervous system. Hence the indigestion, the acrid and flatulent eructations, and the imperfect chylification and nutrition, so frequently associated with torpid function of the large bowels. — d. In children and young persons, the mucous sordes, morbid secretions, and excrementitious matters, that collect as a consequence of this state, become not only a nidus for worms—remarkably favouring their generation; but also a cause of irritation to the mucous surface, to the absorbing vessels, and to the mesenteric glands, owing to their partial absorption, either alone, or with whatever chyle may be formed. That diseases of the intestinal mucous surface, and that obstruction and enlargement of these glands, with the consequent *marasmus*, &c., often arise from the morbid impression and irritation caused by these retained excretions, an extensive experience in the diseases of children has fully convinced me; and that dysentery and diarrhoea, among this class of patients, as well as in adults, frequently proceed from this cause, more especially in warm and unhealthy climates, will be acknowledged by every experienced practitioner. — e. Even many of the diseases that affect the skin, and chronic ulcers of the lower extremities, arise from the absorption from the large bowels of excrementitious matters, that irritate and inflame, in the course of their elimination from the blood by the cutaneous function, the delicate vascular tissue subjacent to the cuticle. This is particularly the case in warm countries and seasons, in which the quantity of these matters always passing out of the circulation by the skin is much greater than is usually supposed. Whatever opinion may be formed as to the origin of such affections, there can be no doubt that the treatment based upon this doctrine is the most successful in removing them. — f. Among other consequences of fæcal accumulations in the colon, elongations and displacements of this bowel may be ranked; and when these changes take place, they increase the disorder which occasioned them. It has often been remarked, particularly by Eschscholtz, Hinz, and others, that displacement of the colon is one of the most common morbid appearances found in the bodies of hypochondriacal and melancholic persons. Torpor or atony of this viscus favouring fæcal accumulations in it, is an important characteristic of these affections, and is manifestly connected with the causation of displacement of the large bowel. (See art. *HYPOCHONDRIASIS*, &c.)

11. ii. TREATMENT.—The indications of cure in cases of torpid function of the colon, consist — 1st, of evacuating whatever fæcal or acrimonious matters may have collected in it; and, 2d, of restoring the energy of the digestive organs, and directing such regimen as may prevent a return of this disorder. — A. Many practitioners, deceived

by the reports of the patient, or misled by the appearances of the stools procured by the first purgatives prescribed, stop far short of the point to which these medicines should be carried. It is not sufficient to order two or three doses of purgatives, or even of active cathartics; but they ought to be repeated, or continued so as to secure their full effect, and be combined with such other medicines as will promote their operation without weakening the parts which they stimulate, and will prevent the patient from being debilitated by them. In all affections of the colon, purgatives that procure full, bulky, and not frequent or watery evacuations, should be selected. The preparations of aloes (F. 181. 454.), those of senna combined with gentian (F. 266. 430.), castor oil, rhubarb and magnesia, precipitated sulphur (F. 45. 82. 96.), the compound jalap powder, &c. (F. 635. 636. 652.), operate in this manner; and, particularly when we wish to promote the secretions from the intestinal surface, may be exhibited after a dose of calomel or blue pill taken at bed-time; or the compound extract of colocynth, or the aloes and myrrh pill, or jalap, may be combined with one of these mercurial preparations, and the extract of hyoscyamus, (see F. 462. 471. 881.). When it is necessary to continue the exhibition of purgatives, they should be either alternated with tonics, or combined with vegetable bitters, which will both promote their action, and increase the strength of the patient, (see F. 562. 572.). When the motions are morbid, great advantage will be derived from resorting to the use of clysmata, as recommended in the article *COLIC* (§ 57. 66. 77.). If fæcal collections to a great extent have formed, they are indispensable remedies; and if symptoms of obstruction, or of irritation, or chronic inflammation, are manifest, they should be assisted by the external means there advised (§ 66. 83.). Under every circumstance, the exhibition of purgatives by the mouth, and of enemata, should be persisted in until the stools assume a natural appearance. (See also the *Treatment* of diseases of the *Cæcum*, and of *CONSTIPATION*).

12. In cases where retained matters in the colon have occasioned irritation, such clysters as will promote the full evacuation of its contents, and at the same time allay irritation, ought to be resorted to from time to time. These will relax irregular constrictions of the bowel, promote the operation of purgatives given by the mouth, dissolve hardened fæces, and loosen the adhesion of tenacious secretions lodged in its cells. In cases of this description, the soap injection, with, or without, the addition of castor or olive oil, the compound decoction of barley with common salt, or the potassio-tartrate of soda; the infusion of linseed, with the biborate, or the carbonate of soda and assafoetida; the decoction of marsh-mallows, with the infusion of camomile-flowers and linseed oil; and the turpentine, triturated with white of egg or mucilage; will have a most beneficial effect, particularly when assisted by appropriate laxatives taken by the mouth. When the irritation of the bowel appears to be accompanied by spasmodic constriction, the aperients should be combined with either camphor, ammonia, ipecacuanha, hyoscyamus, the compound galbanum pill, &c. (F. 463. 890.), according to existing cir-

cumstances. In cases of this kind, much debility is often present, and the functions of the stomach require the aid of light nutritious food and gentle tonics; the purgatives being exhibited either at bed-time, or early in the morning, so as not to disorder the functions of the stomach. Such eccoprotic or alterative laxatives as are slow in their operation (F. 503. 892.) should be taken at night, and purgatives or cathartics that are quick in their action early in the morning, so that they may not interfere either with necessary food or with requisite avocations.

13. When the fecal accumulations cannot be removed by the above means, others of a more powerful nature, as the elaterium or croton oil, assisted by colocynth or terebinthinate injections; and the purgatives advised in the more obstinate cases of *colic* and *constipation*, assisted by shocks of electricity and galvanism passed through the abdomen; should be resorted to. When the bowels are acted upon with great difficulty, the stools being very black and offensive, we may generally infer that not only is the colon torpid, but the follicles are loaded or obstructed, and their secretion morbid. In these cases, galvanism, as shown in an instructive case by Mr. CLARKSON, promises to be of much service. In several instances, when the pulse has been weak, and the skin cool, I have added the extract of nux vomica to the purgative, with much advantage, and combined a portion of this active substance with the liniment (F. 306.) which has been rubbed on the abdomen.

14. B. In order to prevent the re-accumulation of morbid matters in the colon, and give tone to the digestive organs generally, the patient should daily attend to the first intimations of evacuation, and promote the functions of digestion and defæcation, by resorting, whenever they flag, to aperients or laxatives, combined with tonics. Blue pill, with the aloes or myrrh pill, or F. 470., may be occasionally taken at night, and the tonic and aperient medicine (F. 266.) the following morning. The diet and regimen should be carefully regulated, and exercise be taken in the open air, either on foot or horseback. After health has been in a great measure restored, chalybeate mineral waters, and the artificial waters of Ems and Pyrmont, will be productive of much benefit; but frequently it will be more advantageous to commence with the Harrogate or Leamington waters, or with the artificial waters of Seidschutz, Eger, or Carlsbad, and have recourse subsequently to the chalybeates of Cheltenham or Tunbridge. In many cases, the warm or tepid salt water douche over the abdomen, sea-bathing, frictions of the surface of the body, and of the belly especially, night and morning, with either a hard towel or brush, will prove of much service.

15. II. UNNATURAL POSITIONS OF THE COLON, &c. — This viscus is not infrequently found misplaced, and forming singular flexures, in those who have suffered from constipation, fecal retention, dysentery, hypochondriasis, or melancholia. But there are no constant symptoms by which such changes can be inferred with much certainty during the life of the patient. M. ESQUIROL found, out of 168 dissections of melancholic patients, the colon displaced in 33. This change had previously been remarked by MORGAGNI (*De Sed. et Caus. Morb.* epist. iv. art. 16.

et seq.), HALLER (*Elem. Physiol.* l. xxiv. sec. 13. *et seq.*), SOEMMERRING (*De Corp. Hum. Fabrica*, t. iv. p. 313.), and WELLS, but unconnected with mental disorder. In many cases, the bowel is not only displaced, but is also elongated, without being divided, as in its natural state, into cells by partial partitions, and the tonic action of its longitudinal bands. These changes seem to be favoured by relaxation of the mesocolon, and by complete atony of those bands. An elongated and displaced state of the colon is common in cases of old hernia; and in these is often connected with a stretched appearance of the mesentery, but without any organic change of the coats of the bowel: but sometimes the unnatural flexure or duplicature is adherent at its opposite sides, forming a large loop; particularly when it has been consecutive of acute or inflammatory dysentery. Displacement may take place in any part of the bowel, but it is most common in the transverse arch and sigmoid flexure; the former part hanging down towards the pubis, generally in an unadhering, but occasionally in an adhering, loop; and the latter part crossing over to the right side of the abdomen, or passing behind the pubis. Duplicatures of the colon may also form at the right or left parts of its arch; the opposite peritoneal surfaces being more frequently, in such cases, adherent to a considerable extent by coagulable lymph. Several plates are given by Mr. ANNESLEY, illustrative of this change: which is not infrequently observed in fatal cases of chronic dysentery, particularly in warm climates. That these unnatural flexures are also often caused by fecal collections, and by obstructions to the fecal discharges situated either in the rectum or in the sigmoid flexure of the colon, appears very probable; but they may also arise from a naturally elongated formation of the bowel. That, when once produced, they favour such collections, with their consequences, particularly severe dyspeptic and hypochondriacal ailments, dysentery, severe colic, or even ileus, and great distension or inflammation of the colon or small intestines, cannot be doubted; but that they will occasion insanity or melancholy, as ESQUIROL and HENRI suppose, seems not to be made out. Dr. YELLIOLY states, that Mr. LAWRENCE and Mr. DALRYMPLE, who have examined many bodies of insane persons, have very seldom observed in them any deviation from the natural course of the colon.

16. As we have no certain or even probable means of ascertaining the existence of these changes during life, it is unnecessary to offer any remarks on their *treatment*. But this is a matter of but little importance, as the disorders which they produce are in all respects the same as those already noticed; and even if their nature were recognised, they can be remedied or alleviated only by the means described above, particularly by laxative and solvent enemata; and by whatever will, whether taken by the mouth, or injected *per anum*, preserve a fluid state of the stools, or reduce them to a softened condition, and promote the healthy secretions and regular functions of the large bowels, and of the digestive organs in general. (See F. 82. 98. 144.) — See art. DIGESTIVE CANAL, for the organic lesions of the colon. and arts. DIARRHOEA, DYSENTERY, and LIVER-TINES, for its other diseases.)

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cathartic clysters, conjoined with similar substances; the use of coffee and green tea, particularly when this state of disease has followed the ingestion of sedative or narcotic poisons, and after the stomach has been evacuated by emetics and the stomach pump, and washed out by the injection of warm water; are severally of use in this state of coma, and may be resorted to in various combinations, according to the circumstances and severity of the case. All these measures are, however, not equally applicable to every case where this pathological state may be presumed to exist; but the judgment and experience of the practitioner can alone enable him to employ them in an appropriate manner; the shades of difference in particular cases requiring certain means, or peculiar combinations of them, scarcely admitting of description, at least within the limits to which I am necessarily confined.

17. *B.* The second pathological state (§ 13, 14. *b.*), when closely verging, as it occasionally does, upon the first, will require several of the means enumerated with respect to it; whilst, when fully formed, and approaching that of active determination or congestion, but few of them are applicable. Much, however, will manifestly depend upon the habits, and the constitution of the patient; upon the nature and duration of the disease of which coma is an advanced phenomenon; and upon the state of the pulse, the temperature of the head, and the character of the countenance. The first state is injured by blood-letting in any form, it being even not an infrequent consequence of inanition, or even of anæmia of the brain; but this second state will generally be benefited by depletion, and in proportion to its approximation to the third and fourth states described above (§ 13, 14. *c.*). The question chiefly is as to what extent it may be carried, and the manner in which it may be performed. In the majority of cases, local depletions by cupping between the shoulders and nape of the neck, or by leeches applied behind the ears or on the neck and occiput; by simple scarifications by a lancet in the last-named situation, in some cases; in others, bleeding from the feet; whilst they are placed in warm water, and cold or tepid water is being poured in a stream upon the head; and in certain instances the application of a number of leeches on the inside of the tops of the thighs, or about the anus; are the preferable modes of having recourse to depletion in this state of disease: but the extent to which the evacuation should be carried must entirely depend upon the symptoms and circumstances of the case, and the effects produced by it. In addition to this important means, purgatives ought to be given by the mouth, and their action increased by cathartic clysters, in which either assafoetida, valerian, camphor, the terebinthines, or other antispasmodics and stimulants, may be also exhibited. Counter-irritants and derivatives should be applied, but at a distance from the head; and, while a frequent operation of the bowels is procured, the functions of the skin and kidneys should be promoted by diaphoretics and diuretics, the extremities being kept warm, the head cool, its hair cut off, and the shoulders highly elevated. In many instances of this state, even local depletion should be cautiously employed; and in these, as well as in others, much advantage

will often accrue from having recourse to restorative means. It is in this pathological condition of coma, and in those about to be noticed, that oil of turpentine, in large doses, so as to act freely on the bowels, has proved so beneficial in my practice. This state very generally obtains in coma from narcotics and spirituous liquors; and is then, especially, very remarkably benefited by the cold affusion on the head, and the preparations of ammonia.

18. *C.* The third and fourth states (§ 13, 14, *c.*) require nearly the same treatment as the second, but carried much further; general and local depletion, cold affusion on the head, or the application of ice, or evaporating lotions; the most active cathartics, clysters, and derivants or counter-irritants, and the other measures, as fully pointed out in the article on *Inflammation of the Brain* (§ 174.). When these states have gone on to effusion either of blood or of serum,—the sixth pathological condition adduced,—the treatment recommended in *APOPLEXY* and in *DROPSY OF THE ENCEPHALON* (see these articles) should be employed.

19. *D.* The fifth pathological state obviously requires stimulants, tonics, and antiseptics, particularly camphor, in considerable doses; the chlorides of sodium, potassium, &c.; wine, with cordials, spices, &c.; bark, with camphor; purgatives conjoined with stimulants, so as to excite the eliminating or depuratory functions; cathartic, tonic, and antiseptic clysters; calomel, combined with camphor and ammonia, or musk; the turpentine given by the mouth, and in enemata, with capsicum and aromatics; external derivation and counter-irritation; the various balsams, with the chlorides, &c.; quinine, with the aromatic sulphuric acid; the preparations of cinchona or cascarilla with soda, or with the hydrochloric acid, or hydrochloric æther; Cayenne pepper internally, as well as externally in camphorated embrocations, &c. When coma is consequent upon the retrocession of gout, rheumatism, erysipelas, or cutaneous eruptions, the propriety of having recourse to sinapisms, rubefacient pediluvia, and other derivatives, in addition to such other means as the symptoms of the case may suggest, must be obvious. If it follow suppressed discharges, we should endeavour to restore these, or produce one supplemental of them. (See the treatment of the diseases of which coma is most frequently an important symptom.)

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will assume either a concrete or fluid form, owing to modifications of its state as originally secreted, or to the action of other matters upon it during its retention in the bowels or urinary bladder.

24. A singular case has been recorded by Dr. KENNEDY (*Medico-Chirurgical Journal for Sept. 1817.*), of an intestinal concretion, which was found, upon its analysis by Dr. URK, to be similar in its composition to ambergrise.

25. C. Intestinal concretions have been found to consist entirely of those matters which have been swallowed from either a depraved appetite, or bad habit; thus, concretions causing violent symptoms, have been produced by the habit of chewing the ends of threads used in sewing, and which have formed a firm felt with the mucus of the intestines and some fæcal matters. I was lately consulted in the case of a young lady who had been long under treatment for obscure abdominal disease, respecting the nature of which no two of the several eminent practitioners who had been in attendance agreed. The existence of accumulated matters in the cæcum and colon seemed evident to me, upon examination, and from the character of the constitutional and other symptoms. Purgatives and injections were long persisted in; at last several concretions—(about twelve)—from the size of a filbert, to that of a walnut, were evacuated. Upon examination, they presented a substance resembling pasteboard, with a fæcal smell, of a brown colour, and containing earthy particles. On being broken down and macerated, they were found to consist chiefly of coarse paper reduced to a pulpy state, but containing fragments not materially altered. The portions of pulpy paper were agglutinated with mucus, portions of fæces, and a little phosphate of lime. After some time, the patient confessed that she had occasionally been in the habit, about the age of thirteen and fourteen, of chewing, and sometimes swallowing, portions of the grey paper, with which she curled her hair. After the evacuation of these concretions, all the symptoms disappeared, and she rapidly recovered. A few years ago, I attended, with Mr. ANNESLEY, a similar case to the foregoing, but in a younger lady. She recovered perfectly by the use of purgatives and clysters.

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CONGESTION OF BLOOD. CLASSIF. GENERAL PATHOLOGY: and I. CLASS, IV. ORDER (Author, in Preface).

1. DEFIN. Deficient vital tone or power, chiefly of the capillary vessels and veins, occasioning accumulation of blood in them, and a languid or more or less retarded circulation, the functions of the

organ or part being thereby proportionately disordered.

2. I. NATURE AND RELATIONS OF CONGESTION. —It has been stated in other places (see arts. BLOOD, DISEASE,) that morbid states of the vascular system, and of the fluid circulating through it, must be imputed, in a large proportion of cases, to changes induced primarily in the organic nervous system, which is, anatomically, most intimately connected, not only with the circulating system, but also with the organs essentially vital; this connection subsisting by ramifications proceeding to them both directly and obviously either from the great central ganglion, or from appropriate subordinate ganglia, as well as indirectly and less apparently through the medium of the blood-vessels, on which the organic nervous system is everywhere profusely distributed, the one accompanying the other throughout the frame. Thus intimately interwoven, they experience reciprocative changes, and generate a common influence. The vital organs, as well as their subordinate parts, in the more perfect animals, being supplied by both these systems,—the most rudimental type and essential requisites of organisation,—and actuated by their common influence, are thereby enabled to perform their destined functions; the superadded or peculiar organisation of each organ being the instrument, which, thus actuated, performs specific offices in the economy.

3. It results from this,—1st, That we are not justified in considering changes in the states of vascular action, or in the relation subsisting between the vessels and the quantity or quality of the fluids circulating in them, apart from the condition of the organic nervous system, which is thus intimately connected, by structure and function, both with them and with all vital organs; 2d, That changes in the vascular system are very often induced by impressions made primarily upon the organic nervous system; whilst, on the other hand, a morbid state of the former, particularly in respect of its circulating contents, will most seriously affect the latter; and 3d, That upon tracing the procession of morbid phenomena, the first impression made by the exciting cause, and earliest change from the healthy state, will be found in the functions of this system of nerves, in perhaps the larger proportion of cases; vascular action, &c., and the secreting and assimilating functions being very soon afterwards disordered. The truth of these propositions will become more manifest after having surveyed the causes which induce congestion, the phenomena which accompany it either as coincidences or consequences, and the results to which it leads; and we shall be more fully convinced of the propriety of viewing it as very much more frequently a link merely in the chain of morbid action, than as a primary or even an early change.

4. Congestion has been divided by many modern pathologists into *active* and *passive*, they understanding by the former that state of vascular action which coincides with *active determination of blood*, according to the meaning I have attached to it in another article. (See BLOOD, § 25.) It may be defined to be a vital excitement with somewhat of expansion of the vessels, and the circulation of a larger quantity of blood through

them, without any obvious tendency to form new productions, or to occasion disorganisation, unless inflammation, or some other morbid condition, supervene, which is very often the case. From this state—*active congestion* (see BLOOD, § 26.)—in which the vital action of the vessels is above their healthy standard, there is every intermediate grade, lapsing insensibly into extreme *passive congestion*, in which there is deficient or depressed vital power, the current of the circulation through the weakened vessels being remarkably languid and retarded. In this state, the venous and arterial capillaries, having lost the principal part of their tone or vital tension, re-act imperfectly upon the mass of blood injected into them by the heart's action, and become distended and *congested*. This state, then, existing in any degree, down to that which is barely compatible with the continuance of the life of the part, constitutes congestion; it being thus considered as a state of sub-action, and not of super-action, as determination of blood undoubtedly is.

5. i. In respect of *the modes of accession* by which congestion presents itself, much diversity exists. It may occur suddenly, after intense causes; slowly, after slight influences or other disease; and almost insensibly, after active determinations of blood and inflammatory action. It may be almost the primary lesion, the impression made by the exciting cause upon the organic nerves being the only previous change; or it may be one of the most remote, and only antecedent of, or immediately consequent upon, dissolution. It is generally the result of directly or indirectly depressing causes; and assumes every grade according to the intensity of their operation relatively to the organic nervous or vital energies of the frame on which they act.

6. ii. *The textures most liable to undergo congestion* are such as, owing to their conformation, particularly the laxity of their vital and physical cohesion, admit of the distension of their vessels. Cellular parts, and organs in which the cellular structure predominates, as the parenchyma of various internal organs, particularly the brain, the lungs, the liver, spleen, and kidneys; the mucous membranes, especially those of the bronchi and digestive canal, and the uterus and ovaria; are most liable to experience this state of their blood-vessels. Besides these, however, other and less yielding structures, as the serous and fibrous membranes, the skin, the muscles, &c., may be congested to a certain extent, particularly after exhaustion of the vital energies of the frame, and diminution of the vital cohesion of these structures, either by causes which depress the organic nervous power, or by noxious agents contaminating the blood, or by over excitement of the vascular system of the congested part, or of the whole frame. In one or other of these three ways, congestion supervenes when it is observed at the commencement in the course, or towards the close of febrile and constitutional maladies; the same causes, and operating in a similar manner, also occasioning congestion of those viscera which are most liable to it by conformation.

7. iii. *The causes of congestion* are, therefore, 1st, Those which act by primarily depressing the organic nervous influence; such as advanced age; the continued or prolonged impression of cold, mental anxiety, and all the depressing passions

and moral emotions; prolonged sleep, mental and physical inactivity; miasmatic, contagious, or infectious emanations; various vegetable, animal, and gaseous poisons; and the rapid loss of the natural electrical tension of the frame: 2d, Those which mechanically impede the return or circulation of the blood itself, or which change its quantity and quality, either locally or generally; as excessive heat; general plethora, produced either by too full living, or by the suppression of the natural or accustomed discharges, interrupted circulation through the heart, the lungs, liver, &c.; a long retained posture by debilitated persons; the use of unnecessary ligatures and tight lacing; improper and unwholesome food; contamination of the blood by the absorption or introduction into it of noxious mineral, vegetable, and animal substances, or gaseous fluids; and changes taking place in its constitution, from the interrupted secretion and elimination of harmful matters from it (see BLOOD, § 115. *et seq.*)—these latter causes affecting the vital manifestation of the vessels and nervous systems; 3d, Those causes which exhaust the irritability or vital tone of the vessels, by previously exciting them above their natural state of action; as local determinations of blood, general vascular excitement; fatigue from violent or continued exertion; pre-existing fever, inflammation, or other diseases. Thus it will be seen that congestion arises from changes induced (a) in the state of organic nervous power, and externally to the vessels; (b) in the blood itself, and acting internally on the vessels and structures; (c) in the coats of the vessels themselves; and (d) in two or more of these simultaneously.

8. iv. *The symptoms* indicating the existence of congestion are sometimes very apparent, at other times very obscure. When it is present in a marked degree and in vital organs, the disturbance of function is usually so great as to indicate its existence; but even then the kind of disturbance may be very nearly the same as proceeds from morbid states, which we shall hereafter find congestion not infrequently occasions, viz. sanguineous or serous effusion; as in the cases of intense congestion of the encephalon. Upon the whole, however, it gives rise to partial loss, or entire abolition, of the functions of the affected part. Thus, congestion of the brain, when moderate, will occasion a slight state of lethargy, or vertigo, &c.; where more severe, epilepsy, coma, or apoplexy. Congestion of the liver is attended by more or less complete arrest of the biliary secretion, with tumefaction of the organ, &c.; and congestion of the bronchial surface and lungs, with dyspnoea, asthma, &c. Febrile phenomena seldom accompany congestion, unless it arise in the course, or towards the close, of febrile diseases, or be excited by infectious or miasmatic emanations, or is about to pass into an inflammatory or hæmorrhagic state. When it occurs in large secreting viscera or surfaces, the function of secretion is either impeded, vitiated, or altogether suspended; a return or increase of the secreting action either restoring the healthy state of circulation, or converting it into active determination, or even into inflammation. When congestion affects several parts, or two or more important viscera, as on the invasion or towards the close of malignant fevers, or when the circu-

but shortly before, or at the time of death, and yet be very evident upon inspection afterwards. This is not infrequently observed in respect of parenchymatous organs and mucous and villous surfaces. When congestion, however, occurs in the large viscera, as the brain, lungs, liver, and spleen, and continues up to the time of dissolution, it is generally very manifest in them upon dissection. In many diseases, particularly those in which the blood becomes affected previously to, or continues fluid after, death, and in those which terminate by asphyxy, congestion of depending parts is a very common *post mortem* occurrence, and one which should be carefully distinguished from the congestion that has existed during life.

12. II. OF THE TREATMENT OF CONGESTIONS.—

i. It is necessary always to keep in view the fact, that congestion is a consecutive lesion, arising generally from causes which depress the vital manifestation of the organic system of nerves supplying the blood-vessels; and that, although it is very frequently associated with general plethora, and necessarily implies the existence of local plethora (see BLOOD, § 23.), yet, on account of this depression of nervous power, *general depletion*, unless to a small amount, is seldom of much service in the treatment of congestion, unless it be conjoined with the use of stimulants, derivatives, and excitants of the secreting functions.—*a.* But *local depletions*, particularly when directed in such a manner as to operate some degree of revulsion from the congested part, sometimes carried to a considerable extent, or repeated as circumstances require, are among the most requisite means of cure.—*b.* When the powers of life are much reduced, even local depletions should be employed with caution, and never without having recourse, at the same time, or previously, to suitable *excitants* and external *derivatives*. Of these classes of remedies, the most preferable are such as tend to equalise the circulation throughout the viscera, and determine it to the periphery of the frame. *Diaphoretics*; the *warm* or *vapour bath*; warm poultices and fomentations; *rubefacient embrocations*, epithems or poultices, especially those with Cayenne pepper, mustard, horseradish, &c.; *blisters*, and warm and rubefacient *pediluvia*; are calculated to accomplish these purposes.—*c.* Much advantage will also accrue from attempting to restore by *emetics*, *purgatives*, or other remedies, the secretions of the mucous surfaces, and the functions of the congested organ; as the restoration of these functions, which are generally impeded or altogether arrested, will unload the vessels, and accelerate the retarded circulation in them. But it should be kept in mind, that the medicines that operate in this manner are generally local and specific excitants; and hence that they, as well as the stimulants usually given internally, should be exhibited with caution, and preferably at the same time that local depletion, with *derivation* to the surface of the body and lower extremities, are being employed. Without attention to these precautions, we may convert, particularly in plethoric persons, simple congestion into active determination of blood, or into inflammation.—*d.* The *diffusible stimulants* that are generally most serviceable in removing congestions are, camphor, the preparations of ammonia, the æthers, weak infu-

sions of arnica or serpentaria, warm diluents with saline medicines or the nitro-hydrochloric acids, the liquor ammoniæ acetatis, small doses of ipecacuanha, with camphor and opium, &c., and several of the gum-resins and essential oils.—*e.* In many cases of congestion of vital organs, it will be requisite, in addition to the foregoing measures, to direct internal *revulsant agents* to remote viscera. Thus, in congestion of the head or lungs, we shall derive advantage from exciting the action of the lower bowels by *irritating cathartics* and injections; and, having prescribed depletions and external derivation, from a judicious employment of active *diuretics*.—*f.* In all cases, it will be necessary to promote the natural secretions and excretions; inasmuch as we thereby keep up a regular distribution of the circulating fluids, and eliminate from them such hurtful substances as might irritate the vessels and induce consecutive disease, if they were allowed to accumulate.—*g.* In many instances, benefit will accrue from the *affusion* or *asperersion* of cold or tepid water over the part enclosing the congested organ, especially when the state of the pulse, and the seat of congestion, lead us to dread the super-vention of hæmorrhage, as in congestion of the brain or of the lungs.—*h.* Besides the external means already alluded to, various others may be employed near the seat of congestion; as *moxæ*, the actual *cawtery*, dry cupping, stimulating or rubefacient *liniments*, dry friction, the warm and tepid affusion or *douche*, the nitro-hydrochloric acid lotion, chlorine or fumigating baths, electricity or galvanism; but these are most appropriate to the more chronic states of congestion. There are other remedies besides the few now adduced, which are suitable to particular states and seats of congestion, and which fall under different heads.

13. ii. Having removed the congestion, it will be necessary to employ means to prevent its recurrence, for the part once thus affected long retains a morbid disposition. This object can be obtained only by a careful avoidance of the exciting causes—by preserving a free state of the secretions and excretions—by promoting the digestive functions, and invigorating the system by moderate exercise in the open air, either on foot or horseback—by the use of mineral waters, particularly those which combine a tonic with an aperient and deobstruent operation, as the waters of Cheltenham, Harrogate, Scarborough, Leamington, Seidschutz, Carlsbad, Bath, Marienbad, Vichy, and Eger—by warm clothing, and by guarding against general vascular plethora.

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bougie, which ought to be passed as far as possible up the rectum.

24. *d.* If alvine obstruction be apparently owing to organic, malignant, or other diseases about the uterus, its appendages, the vagina, or rectum (§ 10.); or to spasmodic constriction of the sphincter ani excited by inflammatory irritation in its vicinity, or by hæmorrhoids, the warm bath, semicupium, or the hip-bath; the vapour of hot water and narcotic decoctions directed to the anus; anodyne and relaxing injections; and the extract of conium or hyoscyamus, made into either a suppository or an ointment, with the addition of a little of the extract of belladonna; may be prescribed, along with such other measures as the circumstances of the case may require.

25. *e.* When constipation is dependent upon, or associated with, disease of the spine, or inflammatory irritation of the membranes and envelopes of the chord, leeches should be applied near the place where pain is complained of; or the patient may be cupped in the vicinity, kept quiet, and in the horizontal position; and the action of the bowels promoted by the means stated above (§ 16, 17.), and by terebinthinate injections. If inflation of the bowels exist, the carminative liniment may be employed; and if tenderness, tension, or pain of the abdomen be complained of, leeches, followed by fomentations, &c. as already advised (§ 22.), should be resorted to.

26. *C.* Besides the above, other means have been recommended by authors in various states of the disease, and found of much service when appropriately prescribed. JOERDENS advises the frequent administration of *assafoetida* in enemata, and, in cases of deficient secretion and healthy action of the colon, it is certainly of essential use, either alone or in conjunction with purgative medicines. STARKS recommends the inspissated *ox-gall*, both in the form of pills and in clysters. In the latter form, it is calculated to prove an excellent adjuvant of other means; and when combined with aloes, taraxacum, soap, extract of gentian, &c. (F. 559. 562.), it is very serviceable in restoring the healthy functions of the bowels, and digestive organs generally. WENDT directs repeated clysters of the decoction of *gratiola* to be thrown up. Numerous writers have advocated the application of cold, in cases of obstinate constipation. SCHENK, A. FONSECA, BLAKEARD, and LAISON advise the patient to walk or stand upon a marble pavement or slab; and BRASSAVOLUS states that SAVANAROLA cured the Duke of Ferrara, by making him walk barefooted over a cold wet marble floor. STEVENSON, FALCONER, PERCIVAL, and SPENCE direct the affusion of cold water over the lower and upper extremities, and adduce cases wherein the practice had been successful after other measures had failed. KITE, BARTRAM, SANCASSINI, and SCHMIDTMANN recommend cold epithems, and the affusion or aspersion of cold water, over the abdomen; and KÄHLEK, KOMB, and BRANDIS advocate the administration of cold clysmata, in addition to the employment of cold externally. The cold and tepid shower bath, the cold plunge bath, and warm and tepid bathing, have severally been resorted to in aid of other measures, and are frequently of use, — the former particularly

in habitual constipation, the latter in cases attended by difficult and imperfect evacuation, and seemingly dependent upon rigidity of the longitudinal bands of the colon. *Electricity* and *galvanism* have been employed successfully by KITE, SIGAUD LA FOND, GRAPENGISSER, and CLARKSON; and the injection of *tobacco smoke*, and of a weak infusion of the leaves of *tobacco*, has been advised by VON MERTENS, VOGEL, and other authors referred to, when discussing the treatment of COLIC and ILEUS (*which see*). The decoction of *barberry*; powdered *charcoal* (MITCHELL and DANIEL), in the dose of one, two, or three table-spoonsful given every hour in milk or lime water; frictions of the abdomen (QUELMALZ); inunction of it with *linseed* or *olive oil* (RIEDLIN, &c.); fomentations consisting of senna leaves made hot and moist by boiling water, and placed over the abdomen (PETRI); purgative extracts; tinctures, and infusions, applied to this situation, either in the form of ointment or fomentation (SCHENCK, ALIBERT, &c.); and enemata containing the potassio-tartrate of *antimony* (ELIAS), have also been employed. The exhibition of *emetics* was advised by HIPPOCRATES, PRAXAGORUS, CÆLIUS AURELIANUS, and ALEXANDER TRALLES; and of *ipécacuanha* or antimonial emetics by STOLL, SIMS, SUMEIRE, DEPLACE, and HOSACK. I have seen benefit derived from inunction of the abdomen with an admixture of castor and linseed oils, to which three or four drops of croton oil had been added. In a great proportion of the cases of constipation which have occurred to me since 1817, when I first adopted the practice, very certain and immediate advantage has been derived from a full dose of calomel (either with or without opium or hyoscyamus), followed in a few hours by half an ounce of oil of turpentine, and an equal or somewhat larger quantity of castor oil, taken either in a cup of milk, or in a glass of some aromatic water. The action of these has usually been promoted by an injection containing castor, olive, or almond oil; and, if the operation has not been sufficiently copious, another dose of castor oil has been given, and the enema repeated.*

* The following *synopsis* exhibits a succinct view of the treatment. — 1. If the pulse be hard or constricted, and if there be pain, increased on pressure, bleed generally or locally, or both — apply blisters or hot fomentations, or the cold effusion, or cold epithems, &c., on the abdomen; afterwards exhibit purgatives, enemata, &c. 2. If constipation seems to arise from diminished secretion and exhalation, give calomel or blue pill, carbonates of the alkalies, jalap, the purgative oils, senna, camboge, elaterium, croton oil, &c., according to circumstances. 3. If it depend upon a rigid fibre and habit of body, combine purgatives with relaxants and nauseants — with *ipécacuanha*, antimony, colchicum, soda, hyoscyamus, &c.; prescribe emollient and relaxant medicines in preference to those that are acrid; and give them with antispasmodics and sedatives. 4. When it arises from torpid peristaltic action and lessened secretion, conjoin tonics, gum resins, and bitters, with purgatives and aperients; myrrh, *assafoetida*, galbanum, &c., with aloes; sulphate of quinine, or ext. of gentian with aloes; the alkaline solutions, with tonic infusions; use friction with stimulating liniments to the abdomen, or along the spine; resort to the cold salt-water bath or shower bath, and the tonic and aperient mineral waters of Cheltenham, Leamington, Vichy, and Carlsbad. 5. When it is attended by accumulations of hardened feces in the colon, have recourse to copious soapy or oily clysters — to the introduction of a marrow-spoon to break down the feces — to the injections of cold water, &c., by the valve-apparatus, with a long bougie attached to the pipe — to the aspersion of cold water on the abdomen, or the application of cold to the lower extremities, &c. 6. If it proceed from organic change of the large bowels, or of parts affecting them, solicit evacuation by emollient and relaxant enemata, and

vary as greatly in duration, modes of accession, and recurrence, as well as in the number of parts affected by them. Hence, they may be *acute* or *chronic*—most frequently the former; *partial* or *general*; *continued*, *recurrent*, or *intermittent*; *uncertain*, in their accession, or *periodic*; and they may, moreover, attack a number of parts in succession. The circumstances and causes which originate them will also impart to them certain characters, which, although frequently difficult of detection, should not be overlooked. Thus, they are either *idiopathic* or *symptomatic*, most frequently the latter, even when the primary lesion illudes observation. But these diversities of form, although most deserving of attention, can only partially serve as a basis for the practical consideration of convulsions. I shall therefore view them—1st, In respect of their partial or local occurrence; 2d, As to their general manifestations; 3d, As they affect infants and children; and, 4th, As we observe them in connection with the puerperal states: I shall also notice them as associated with, or consequent upon, other acute diseases.

7. i. **PARTIAL OR LOCAL CONVULSIONS:**—Many of the disorders which have been imputed to convulsion of individual parts, fall more appropriately under the denomination of spasm. I shall therefore briefly notice only such as, from the alternation of relaxation and contraction, appear to approximate to the convulsive state. *A. Involuntary contractile parts* are more subject to spasmodic action, than to that which may be said to be really convulsive. Whether or not certain of the phenomena presented in various diseases of the alimentary canal, as gastrodynia, pyrosis, rumination, retchings, colic, borborygmi, ileus, the tormina of dysentery, &c., are more properly convulsive or spasmodic, must be entirely a matter of opinion, to which but little practical importance should be attached, as they are both modifications merely of the same proximate condition. This remark applies equally to the abnormal actions sometimes presented by the urinary bladder and uterus; and it is probable that palpitations of the heart, and angina pectoris, are chiefly manifestations of convulsive contractions of this viscus. (See ANGINA PECTORIS, and HEART—*Palpitations of*.) That hiccup is altogether owing to convulsive actions of the diaphragm, cannot be doubted. (See HICCUP.)

8. *B. Voluntary muscles and parts* present the most unequivocal appearance of partial or local convulsions; although several local affections, denominated convulsive by some writers, are, more strictly speaking, spasm or cramp of particular muscles.—*a.* The muscles of the *eye-lids*, owing either to the contraction of an ill habit, or to irritation of the ophthalmic branch of the fifth pair of nerves, are sometimes clonically convulsed—forming the *nictitatio* of authors.—*b.* The muscles of the *eye-balls* are also not infrequently similarly affected, particularly in infants and children—occasioning, particularly during sleep, rolling of the eyes. This state of local convulsion is common during dentition, and disorders of the stomach and bowels. Either a more severe state of convulsion of these muscles, approaching to spasmodic contraction of one or more of them, or a paralysis of their antagonists, will occasion distortion of the eyes, or strabismus,

with or without irregular oscillations of the iris, dilated pupil, &c.; as in inflammatory and organic affections within the cranium, and in verminous disorders.—*c.* Twitching convulsions of the *muscles of the face*, or those inserted into the lip, retraction of the angles of the mouth, giving rise to what has been called the *risus sardonius*; are often observed, but generally as a symptom of the invasion or actual existence of most dangerous diseases; as inflammation of the encephalon, or of the diaphragm, and various organic changes affecting the substance of the brain. Twitching of the muscles of the face, however, sometimes occur in persons of a nervous and irritable temperament, or with an excited brain, without any apparent disease.—*d.* Convulsive movements of the *tongue* are seldom observed unconnected with irregular movements of other parts, unless in the diseases now named and in apoplexy.—*e.* Slight convulsive actions of the *muscles of the lower jaw*, giving rise to grinding of the teeth in sleep, are very common occurrences in persons with worms, or other diseases of the alimentary canal; or excited circulation of the encephalon. I have seen a case of clonic convulsion of the muscles of the lower jaw, this part being in a state of constant motion, alternately to either side, owing to the contractions of one side taking place when relaxation occurred in the other.—*f.* *Trismus*, or spasmodic contraction of these muscles in infants, arises from disorders of the prima via, the impression of cold, or irritation of the umbilicus, but does not strictly fall under the head of convulsions.—*g.* A clonically convulsed state of the *muscles of the neck* are sometimes, but rarely, observed, producing convulsive tremor, or shaking palsy of the head, which is aggravated on certain occasions of mental perturbation, and nervous or vascular excitement. (See PALSY, SHAKING, and TREMOR.—*h.* The abnormal actions which approximate more closely to the permanent or spastic contractions, and affect one or more of the cervical and adjacent muscles, are much more common, and are often induced by a current of cold air, by over-straining, or by inflammatory irritation about the bodies, or intervertebral substance of the upper cervical vertebrae; or from disease about the medulla oblongata or base of the brain; or from irritation of remote parts—as at the genital organs of the uterus or ovaria; or from strangulated hernia,—an instance of which last has been observed by myself. In all such cases, the head is drawn more or less to one side, or backwards, or forwards; but similar flexures of the neck often are occasioned by the paralysis of muscles on the side from which the head is bent, the tonic or natural action of the unaffected muscles drawing the head from the paralyzed side. In the one case, however, the muscles are rigid and strung like a cord on the contracted side, and more or less pain is complained of either in them or in the vicinity, particularly on attempts to bend or turn the head or neck in the opposite direction; whilst, in the other case, these symptoms are wanting. These are more properly cases of spasm than of local convulsion, as the contraction seldom alternates with relaxation, but is commonly more or less permanent. However, cases sometimes occur, which are intermediate between permanent spasm and con-

vulsion, especially as a symptom of the diseases last referred to.—*i.* Convulsive movements in the *pharynx* and *œsophagus*, impeding or preventing deglutition, are frequent in hysteria, and in the last stage of several fatal diseases.—*k.* They also affect the muscles of the *larynx*, the *diaphragm*, and other respiratory muscles, either separately, in rapid succession, or nearly simultaneously. Some of these affections are transient, and the result of slight causes; as in sneezing, coughing, sighing, sobbing, &c.: others are extremely dangerous, owing to the nature of the parts affected, the severity and continuance of the convulsive movements, and the circumstances in which they supervene; as in spasm of the glottis, spasmodic croup, certain states of asthma, with severe fits of coughing, singultus, &c.—*l.* Convulsive actions also occur in the *muscles of the abdomen*; as in hysteria, common and lead colic, and in consequence of intestinal worms. The most remarkable instances of true convulsions of the abdominal muscles merely, that I have observed, have occurred in adult persons infested by the large round worm.—*m.* The *muscles of the spine* sometimes experience convulsive actions, but more frequently spastic contractions, occasioned by hysteria, disease of the bodies of the vertebræ or membranes of the spinal chord, injuries of adjoining parts, strangulated hernia, acute rheumatism, the passage of biliary or renal calculi along the ducts, and inflammatory irritation of the uterus or ovaria.—*n.* Either one or both of the *upper extremities* are occasionally affected by convulsions, more commonly both. The fingers are generally clenched around the thumb, which is drawn upon the palm; the arm being either extended forcibly, and the hand turned as in pronation, or the fore-arm bent upon the arm, or both these occurring in rapid alternation. Such are the more tonic convulsions of the upper extremities; but their muscles also experience slight and extremely clonic contractions; as the *rebutus tendinum* often observed towards the close of fevers and diseases of the brain; the more tonic or spastic convulsions, particularly when affecting one arm only, also arising from lesions of some part of the encephalon, or of the upper portion of the spinal chord.—*o.* Convulsions of the *lower extremities* are characterised by analogous movements, and chiefly affect the flexor and extensor muscles. The toes are bent downwards, and the legs and thighs either drawn upwards or extended, or both the one and the other alternately.

9. Convulsions of voluntary muscles may occur as now described, or in two or more situations, or even in different or opposite parts, either simultaneously or in succession. They may affect one side of the body only, the other being in its natural state, or paralysed. They much less frequently attack either half transversely.

10. *ii.* GENERAL CONVULSIONS.—General convulsions observe no certain mode of accession. On some occasions they attack suddenly; but they are much more frequently preceded by premonitory signs, especially in children and chronic cases,—a knowledge of, and attention to, which may be made available in preventing their occurrence. They are also sometimes recurrent, or succeed each other, with more or less rapidity.

11. *A.* The premonitory signs are vertigo and

dizziness, irritability of temper; flushings, or alternate flushing and paleness of the face; luminous or other spectra floating before the eyes; various noises in the ears; partial loss of sight or hearing; restless or unsound sleep, or uncommon weight or drowsiness; fulness or prominence, and rolling of the eyes; clenching, or grinding of the teeth, clenching of the hands, &c. during sleep; a tumid appearance of the countenance and hands; coldness or cramps of the extremities; slight tremors, shivering, horripilation, shudderings or horrors; nausea, retching or vomiting; or pain and distension of stomach and left hypochondrium; unusual flatulence of the stomach and bowels, or other dyspeptic symptoms; pains in the loins or back; frequent sighing or sobbing; numbness of various parts; stammering or impeded utterance, loss of memory, and absence of mind; palpitations, or slowness and irregularity of pulse; slow, laborious, or irregular respiration; and sometimes, a copious discharge of limpid urine. In some instances, leipothymia, or threatened syncope, precedes the general convulsions.

12. *B. a.* The more tonic seizure.—The convulsive movements constituting the paroxysm generally follow rapidly upon one or more of the above signs, and vary remarkably as to violence and duration. During their continuance, the countenance is very much distorted; the eye-balls are prominent, full, wild, staring, and rolled in all directions; the eyelids are either open, or rapidly shut and opened; the patient grinds and gnashes his teeth, and sometimes foams at the mouth, or protrudes the tongue. The alternate contractions and relaxations of the whole voluntary muscles, and contractions and extensions of all the limbs, are performed with the utmost irregularity, rapidity, and with so great force, as often to require the united strength of several persons to preserve the patient from injuring himself. In these struggles, the teeth, or even the bones of the extremities, have been, in some instances, broken. The respiration is laborious, interrupted, and sometimes accompanied by a hissing noise. The countenance, and indeed the whole scalp, are sometimes tumid, bloated, or red, and often leaden or livid towards the close of the fit, particularly in plethoric persons, when the respiratory actions are much impeded, and the affection originates in cerebral disease. In other cases, the face is pale, and the pulse weak, or small and constricted. The urine and fæces are occasionally voided with violence during the paroxysm: occasionally large quantities of limpid urine are passed. In these, the pulse is generally full, strong, and commonly slow or irregular. In many instances, the general sensibility and consciousness are but very slightly impaired, particularly in the more simple cases, and when the proximate cause is not seated in the encephalon; but in proportion as this part is affected, primarily or consecutively, and the neck and face tumid and livid, the cerebral functions are obscured, and the convulsions attended by stupor, delirium, &c., or rapidly pass into, or are followed by, these states.

13. *b.* The more clonic convulsions.—Such are the common manifestations, of convulsions, when they are not occasioned by inanition; the paroxysms, however, varying greatly in violence, duration, and frequency of recurrence, according to the degree of vital energy, and numerous other

vary as greatly in duration, modes of accession, and recurrence, as well as in the number of parts affected by them. Hence, they may be *acute* or *chronic*—most frequently the former; *partial* or *general*; *continued*, *recurrent*, or *intermittent*; *uncertain*, in their accession, or *periodic*; and they may, moreover, attack a number of parts in succession. The circumstances and causes which originate them will also impart to them certain characters, which, although frequently difficult of detection, should not be overlooked. Thus, they are either *idiopathic* or *symptomatic*, most frequently the latter, even when the primary lesion illudes observation. But these diversities of form, although most deserving of attention, can only partially serve as a basis for the practical consideration of convulsions. I shall therefore view them—1st, In respect of their partial or local occurrence; 2d, As to their general manifestations; 3d, As they affect infants and children; and, 4th, As we observe them in connection with the puerperal states: I shall also notice them as associated with, or consequent upon, other acute diseases.

7. i. **PARTIAL OR LOCAL CONVULSIONS:**—Many of the disorders which have been imputed to convulsion of individual parts, fall more appropriately under the denomination of spasm. I shall therefore briefly notice only such as, from the alternation of relaxation and contraction, appear to approximate to the convulsive state. *A. Involuntary contractile parts* are more subject to spasmodic action, than to that which may be said to be really convulsive. Whether or not certain of the phenomena presented in various diseases of the alimentary canal, as gastrodynia, pyrosis, rumination, retchings, colic, borborygmi, ileus, the tormina of dysentery, &c., are more properly convulsive or spasmodic, must be entirely a matter of opinion, to which but little practical importance should be attached, as they are both modifications merely of the same proximate condition. This remark applies equally to the abnormal actions sometimes presented by the urinary bladder and uterus; and it is probable that palpitations of the heart, and angina pectoris, are chiefly manifestations of convulsive contractions of this viscus. (See ANGINA PECTORIS, and HEART—*Palpitations of*.) That hiccup is altogether owing to convulsive actions of the diaphragm, cannot be doubted. (See HICCUP.)

8. *B. Voluntary muscles and parts* present the most unequivocal appearance of partial or local convulsions; although several local affections, denominated convulsive by some writers, are, more strictly speaking, spasm or cramp of particular muscles.—*a.* The muscles of the *eye-lids*, owing either to the contraction of an ill habit, or to irritation of the ophthalmic branch of the fifth pair of nerves, are sometimes clonically convulsed—forming the *nictitatio* of authors.—*b.* The muscles of the *eye-balls* are also not infrequently similarly affected, particularly in infants and children—occasioning, particularly during sleep, rolling of the eyes. This state of local convulsion is common during dentition, and disorders of the stomach and bowels. Either a more severe state of convulsion of these muscles, approaching to spasmodic contraction of one or more of them, or a paralysis of their antagonists, will occasion distortion of the eyes, or strabismus,

with or without irregular oscillations of the iris, dilated pupil, &c.; as in inflammatory and organic affections within the cranium, and in verminous disorders.—*c.* Twitching convulsions of the *muscles of the face*, or those inserted into the lips; retraction of the angles of the mouth, giving rise to what has been called the *risus sardonius*; are often observed, but generally as a symptom of the invasion or actual existence of most dangerous diseases; as inflammation of the encephalon, or of the diaphragm, and various organic changes affecting the substance of the brain. Twitching of the muscles of the face, however, sometimes occur in persons of a nervous and irritable temperament, or with an excited brain, without any apparent disease.—*d.* Convulsive movements of the *tongue* are seldom observed unconnected with irregular movements of other parts, unless in the diseases now named and in apoplexy.—*e.* Slight convulsive actions of the *muscles of the lower jaw*, giving rise to grinding of the teeth in sleep, are very common occurrences in persons with worms, or other diseases of the alimentary canal; or excited circulation of the encephalon. I have seen a case of clonic convulsion of the muscles of the lower jaw, this part being in a state of constant motion, alternately to either side, owing to the contractions of one side taking place when relaxation occurred in the other.—*f.* *Trismus*, or spasmodic contraction of these muscles in infants, arises from disorders of the prima via, the impression of cold, or irritation of the umbilicus, but does not strictly fall under the head of convulsions.—*g.* A clonically convulsed state of the *muscles of the neck* are sometimes, but rarely, observed, producing convulsive tremor, or shaking palsy of the head, which is aggravated on certain occasions of mental perturbation, and nervous or vascular excitement. (See PALSY, SHAKING, and TREMOR.—*h.* The abnormal actions which approximate more closely to the permanent or spastic contractions, and affect one or more of the cervical and adjoining muscles, are much more common, and are often induced by a current of cold air, by over-straining, or by inflammatory irritation about the bodies, or intervertebral substance of the upper cervical vertebrae; or from disease about the medulla oblongata or base of the brain; or from irritation of remote parts—as of the genital organs of the uterus or ovaries; or from strangulated hernia,—an instance of which last has been observed by myself. In all such cases, the head is drawn more or less to one side, or backwards, or forwards; but similar flexures of the neck often are occasioned by the paralysis of muscles on the side from which the head is bent, the tonic or natural action of the unaffected muscles drawing the head from the paralysed side. In the one case, however, the muscles are rigid and strung like a cord on the contracted side, and more or less pain is complained of either in them or in the vicinity, particularly on attempts to bend or turn the head or neck in an opposite direction; whilst, in the other case, these symptoms are wanting. These are more properly cases of spasm than of local convulsion, as the contraction seldom alternates with relaxation, but is commonly more or less permanent. However, cases sometimes occur, which are intermediate between permanent spasm and con-

vulsion, especially as a symptom of the diseases last referred to.—*i.* Convulsive movements in the *pharynx* and *œsophagus*, impeding or preventing deglutition, are frequent in hysteria, and in the last stage of several fatal diseases.—*k.* They also affect the muscles of the *larynx*, the *diaphragm*, and other respiratory muscles, either separately, in rapid succession, or nearly simultaneously. Some of these affections are transient, and the result of slight causes; as in sneezing, coughing, sighing, sobbing, &c.: others are extremely dangerous, owing to the nature of the parts affected, the severity and continuance of the convulsive movements, and the circumstances in which they supervene; as in spasm of the glottis, spasmodic croup, certain states of asthma, with severe fits of coughing, singultus, &c.—*l.* Convulsive actions also occur in the *muscles of the abdomen*; as in hysteria, common and lead colic, and in consequence of intestinal worms. The most remarkable instances of true convulsions of the abdominal muscles merely, that I have observed, have occurred in adult persons infested by the large round worm.—*m.* The *muscles of the spine* sometimes experience convulsive actions, but more frequently spastic contractions, occasioned by hysteria, disease of the bodies of the vertebrae or membranes of the spinal chord, injuries of adjoining parts, strangulated hernia, acute rheumatism, the passage of biliary or renal calculi along the ducts, and inflammatory irritation of the uterus or ovaria.—*n.* Either one or both of the *upper extremities* are occasionally affected by convulsions, more commonly both. The fingers are generally clenched around the thumb, which is drawn upon the palm; the arm being either extended forcibly, and the hand turned as in pronation, or the fore-arm bent upon the arm, or both these occurring in rapid alternation. Such are the more tonic convulsions of the upper extremities; but their muscles also experience slight and extremely clonic contractions; as the *subulcus tendinum* often observed towards the close of fevers and diseases of the brain; the more tonic or spastic convulsions, particularly when affecting one arm only, also arising from lesions of some part of the encephalon, or of the upper portion of the spinal chord.—*o.* Convulsions of the *lower extremities* are characterised by analogous movements, and chiefly affect the flexor and extensor muscles. The toes are bent downwards, and the legs and thighs either drawn upwards or extended, or both the one and the other alternately.

9. Convulsions of voluntary muscles may occur as now described, or in two or more situations, or even in different or opposite parts, either simultaneously or in succession. They may affect one side of the body only, the other being in its natural state, or paralysed. They much less frequently attack either half transversely.

10. *ii.* GENERAL CONVULSIONS.—General convulsions observe no certain mode of accession. On some occasions they attack suddenly; but they are much more frequently preceded by premonitory signs, especially in children and chronic cases,—a knowledge of, and attention to, which may be made available in preventing their occurrence. They are also sometimes recurrent, or succeed each other, with more or less rapidity.

11. *A.* The premonitory signs are vertigo and

dizziness, irritability of temper; flushings, or alternate flushing and paleness of the face; luminous or other spectra floating before the eyes; various noises in the ears; partial loss of sight or hearing; restless or unsound sleep, or uncommon weight or drowsiness; fulness or prominence, and rolling of the eyes; clenching, or grinding of the teeth, clenching of the hands, &c. during sleep; a tumid appearance of the countenance and hands; coldness or cramps of the extremities; slight tremors, shivering, horripilation, shudderings or horrors; nausea, retching or vomiting; or pain and distension of stomach and left hypochondrium; unusual flatulence of the stomach and bowels, or other dyspeptic symptoms; pains in the loins or back; frequent sighing or sobbing; numbness of various parts; stammering or impeded utterance, loss of memory, and absence of mind; palpitations, or slowness and irregularity of pulse; slow, laborious, or irregular respiration; and sometimes, a copious discharge of limpid urine. In some instances, leipothymia, or threatened syncope, precedes the general convulsions.

12. *B. a.* The more tonic seizure.—The convulsive movements constituting the paroxysm generally follow rapidly upon one or more of the above signs, and vary remarkably as to violence and duration. During their continuance, the countenance is very much distorted; the eye-balls are prominent, full, wild, staring, and rolled in all directions; the eyelids are either open, or rapidly shut and opened; the patient grinds and gnashes his teeth, and sometimes foams at the mouth, or protrudes the tongue. The alternate contractions and relaxations of the whole voluntary muscles, and contractions and extensions of all the limbs, are performed with the utmost irregularity, rapidity, and with so great force, as often to require the united strength of several persons to preserve the patient from injuring himself. In these struggles, the teeth, or even the bones of the extremities, have been, in some instances, broken. The respiration is laborious, interrupted, and sometimes accompanied by a hissing noise. The countenance, and indeed the whole scalp, are sometimes tumid, bloated, or red, and often leaden or livid towards the close of the fit, particularly in plethoric persons, when the respiratory actions are much impeded, and the affection originates in cerebral disease. In other cases, the face is pale, and the pulse weak, or small and constricted. The urine and feces are occasionally voided with violence during the paroxysm: occasionally large quantities of limpid urine are passed. In these, the pulse is generally full, strong, and commonly slow or irregular. In many instances, the general sensibility and consciousness are but very slightly impaired, particularly in the more simple cases, and when the proximate cause is not seated in the encephalon; but in proportion as this part is affected, primarily or consecutively, and the neck and face tumid and livid, the cerebral functions are obscured, and the convulsions attended by stupor, delirium, &c., or rapidly pass into, or are followed by, these states.

13. *b.* The more clonic convulsions.—Such are the common manifestations, of convulsions, when they are not occasioned by inanition; the paroxysms, however, varying greatly in violence, duration, and frequency of recurrence, according to the degree of vital energy, and numerous other

vulsions were most violent, giddiness, with loss of hearing and recollection. During convalescence, the least fright, or sudden alarm, brought on a slight paroxysm. (See CHOREA AND RELATED AFFECTIONS, &c.)

19. *iii. INFANTILE CONVULSIONS.* — Convulsions often attack infants of a delicate and irritable frame, and those who are seized by severe internal or constitutional disease, or are suffering some concealed visceral irritation. They occur most frequently in children under four or five years of age, and particularly during dentition. They decline in frequency from this epoch to the commencement of the second dentition, or about the seventh year, when they again are often met with. Mr. NORTH doubts that any increase takes place at the seventh year. The above is the result of my experience, which in great measure agrees with that of BEAUMES, TISSOT, and others. As infantile convulsions present various peculiarities in their causes, phenomena, complications, and consequences, and are besides among the most important morbid conditions which come before the practitioner, I shall consider them apart.

20. *A. Premonitory signs* often usher in the attack, but occasionally no such symptoms are observed. I suspect, however, that they are more commonly altogether overlooked, than entirely absent. They consist chiefly of manifestations of generally increased irritability. This is shown by the temper, if the child be a few months old or upwards; by want of sleep at night, and heaviness in the day, or by perfect insomnia; by a lighter and shorter sleep than usual, the child starting up on the slightest noises, or as from a frightful dream, with fits of screaming without evident or sufficient cause; by alternately flushed and pale countenance or unwonted animation of the face and eyes, followed by languor and heaviness; by a half closed or open state of the eyelids during slumber, with startings and twitchings; by fixed, vacant, staring eyes, the pupils being either contracted or dilated, or frequent oscillations of the iris, without being influenced by the admission of light, or contraction of one pupil while the other is dilated; by stretchings or rigid extensions of the limbs; by hiccup, or irregularity of breathing, or short gasps, followed by long laborious inspirations; by twitchings of the fingers, or clenching of the hands, or pressure of the thumb upon the palm, the fingers being extended and separated from each other, or frequently moved about; by the sudden relinquishing of the breast soon after having sought it eagerly, and the throwing back the head, with an expression of anxiety, and an appearance of difficult deglutition; and by fulness of the upper lip, with a pinched nose and countenance, and slight blue-ness below the eyes and about the mouth. Many of these symptoms, designated by the vulgar, "*inward fits*," may with justice be attributed to inflammatory irritation of the arachnoid, as indeed contended for by PARENT, MARTINET, LALLEMAND, &c.; and, in my opinion, especially of the arachnoid of the base and internal surfaces of the brain. BRACHET and NORTH have enumerated them as premonitory of convulsions, which they doubtless most frequently precede; but in a great many cases convulsions hold the same relation to inflammatory and febrile attacks in infants, as rigors do to the same diseases occurring in adults;

and hence these signs must often be common to both, and also to some other infantile diseases. This is shown by their frequency in remittent fever, and other inflammatory irritations of the gastrointestinal mucous surface of children.

21. *B. The paroxysm of convulsions* in children is similar to that occurring in adults. In the most severe cases, there is a violent, involuntary, and alternating or convulsive action of all the voluntary muscles extending to some internal or involuntary parts; in which, indeed, the affection often seems to originate, or which appear to be those first affected. In plethoric infants, the face and scalp are tumid, reddened, and subsequently livid; the eyes are distorted and staring, or turned up beneath the upper eyelid, leaving only the schlerotic visible; the respiration is impeded and laborious, but very rarely attended by foaming at the mouth and protrusion of the tongue, unless the paroxysm be epileptic. The whole surface often becomes slightly violet-coloured towards the close of the fit, and the hands tumid. In many instances, particularly in weak or exhausted children, the seizure is much less violent, the countenance being pale and collapsed, and the convulsions more clonic. There are sometimes only twitchings of the muscles of the face, and alternate contractions and relaxations, or rapid shocks, of a few parts, or of only one half of the body, or of various parts in succession, with slight blueness about the eyes and mouth; but more frequently the whole body is convulsed, and the countenance distorted and haggard. In some cases, the thumbs are drawn into the palms, and the great toes towards the soles. The mental faculties, and general sensibility, in the slight or clonic convulsions, are generally not interrupted. They are also, however, frequently obscured, but only during the height of the paroxysm; and sometimes even entirely abolished in the severe recurrent convulsions attending cerebral disease — the *eclampsia* of some authors (§24.).

22. *C. The utmost diversity exists as to the duration and recurrence of the fit.* In some cases it is only momentary or of a very few minutes' duration. In other instances it continues for several hours, with frequent remissions. It may likewise cease, and shortly afterwards return, and thus subside and recur at short but irregular intervals for several times, and at last cease altogether, or terminate life. Or the first seizure may be so severe as to be fatal. These recurring fits are often at last attended by insensibility, which is not altogether, or even not at all, recovered from in the intervals. This form of the malady is more common in children than in adults, excepting as it occurs in the puerperal states, or towards the termination of tumours and abscesses in the brain. As the convulsive movements constituting the fit become less and less violent and constant, and respiration fuller and freer, the natural appearance of the surface returns, and the child is enabled to cry; it afterwards falls either into a refreshing sleep, or, if the convulsions have a cerebral origin, into a stupid or lethargic state of various duration.

23. *D. There is a species of spastic or tonic convulsion, which is but rarely met with, affecting chiefly the extremities.* It seems more nearly allied to spasm than convulsion, into which, however, it sometimes passes; and occurs, chiefly,

peral convulsions, in which both are lost; by the general absence of the consecutive sleep or sopor of epilepsy; by the irregular and frequently recurring form of the seizure; by what is known of its origin and connection with obvious causes, and by the mode of its attack and of recovery from it. There are also various symptoms which, although common to eclampsia, puerperal convulsions, and epilepsy, are yet peculiarly characteristic of this last; and we find, in addition, other phenomena which simple convulsions seldom present, particularly the frightful scream on the accession of the epileptic fit, the antecedent aura or peculiar premonitory signs, the very sudden and unexpected seizure when the aura is wanting, the expulsion of the seminal and prostatic secretions, as well as of the alvine excretions; the more frequent occurrence of foaming at the mouth, and severer affection of the respiratory muscles; the more leaden appearance of the countenance, and the more common recurrence of the paroxysm at a stated time, than in convulsions, particularly after the first sleep, or when the patient awakens or is rising in the morning. (See EPILEPSY—*Diagnosis*.)—*β*. Convulsions are readily distinguished from *hysteria*, by the antecedent copious discharge of pale urine, the globus hystericus, and the borborygmi; and by the alternate crying and laughing attending the seizure of the latter. Some instances of simple convulsion, arising from irritation of the female organs, will, however, very nearly approach, if not altogether run into, the hysterical character; as we also see many cases of puerperal convulsion differing but little from epilepsy, excepting in the frequent recurrence of the paroxysm in the former before the patient has recovered from the sopor consequent upon the antecedent fit, and in one or two of the diagnostic signs noticed above.—*γ*. The continued or permanent nature of the spasms in all the forms of *tetanus*, and the absence of any tendency to obscuration of the general sensibility and mental faculties, during the whole unremitting duration of this dreadful disease, are sufficient diagnostics between it and convulsions.—*δ*. *Rabidity* cannot be mistaken for this affection, if the history of the case, the uncommonly increased sensibility of the whole frame, the dread of fluids, and unimpaired cerebral functions, characterising rabies, be attended to; for, although convulsive seizures occur frequently in it, they are produced by so slight external or mental causes—by every attempt at swallowing liquids—that their nature and origin cannot be for a moment doubted. (See *RABIDITY*.)

36. III. TERMINATIONS OR CONSEQUENCES, AND PROGNOSIS.—*A*. Convulsions, in any of the forms now placed before the reader, may terminate, (*a*) in health; (*b*) in some other disease; or, (*c*) in immediate dissolution. *a*. Their termination in health may be marked by no peculiar phenomenon, beyond the non-recurrence of the seizure. In other cases they are followed by critical evacuations, particularly hæmorrhage from the nose, mouth, or ears, after which they may never recur, or which may produce an immunity from them for a time. Vomiting and diarrhœa, or the accession of the catamenia, may likewise prove critical.

37. *b*. They often are followed by other diseases;

or rather the original disorder or change of structure, of which convulsions are merely a part of the sensible and outward signs, may, from its increase, or extension to adjoining parts, occasion other or additional phenomena more or less intimately allied to convulsion, as palsy, apoplexy, coma, loss of speech, or of sight, or hearing, chorea, or mania, delirium, idiotcy, &c., each of which may pass into the other, or be variously associated with one another. Thus, loss of sight, hearing, speech, and idiotcy, may be the consequences in the same case. Also, either of these consecutive phenomena may arise from the cerebral congestion, and its effects, produced by the frequent recurrence or by the severity of the fit, particularly when the respiratory functions are much impeded in it, and the system is plethoric and relaxed. My limits will not admit of illustrations of these facts, either from my own experience, or from the other sources which are referred to at the end of the article; but they are of common occurrence, and may, after continuing for a longer or shorter time—in some cases for many years—in others for a very short period—either be recovered from, or terminate existence. In some cases, convulsions are followed by a state of leipothymia, trance, or complete syncope, which, when profound and continued, may be mistaken for dissolution, and endanger premature interment. There is reason to suppose that, in some countries where interment usually follows death at a much shorter period than in Great Britain, this dreadful fate has overtaken the patient. In other instances, lethargy, or torpor, terminates the paroxysm, which, in rare instances, has been of long duration, and also may be mistaken for death. Whilst the convulsions of childhood more commonly give rise to, or terminate in, loss of one or more of the functions of sense, in chorea, in idiotcy, or in hydrocephalus; those attacking adults are more disposed to pass into either apoplexy, coma, palsy, or mania: and whilst the convulsions of the former class of subjects are more frequently the consequence of irritations affecting the abdominal viscera, those of the latter, excepting in females, are more generally the result of disease within the cranium or spinal column, often at a certain stage of its progress.

38. *c*. Their termination in death takes place either through the intervention of one or more of the diseases noticed above as their consequences, or, more directly, from the extension of convulsion or spasm to the respiratory muscles, inducing asphyxy, or from an overwhelming congestion or effusion of blood in the brain. This sudden unfavourable change more commonly occurs in puerperal convulsions than in other forms, excepting when they proceed from abscesses or tumours within the cranium. Death may also occur from accidental suffocation during the paroxysm.

39. *B*. The PROGNOSIS of convulsions depends chiefly on what is known of their causes, on the antecedent and consecutive phenomena, on the history of the case, and the degree in which the functions of the brain and nervous system are affected during and after the fit. *a*. If the convulsions occur in children, without fever or any primary or cerebral disturbance, and apparently from worms, disorder of the prima via, &c., a favourable opinion may be entertained.

But when they are preceded by head-affection, by fever, followed by strabismus, stupor, or loss of one or more of the functions of sense; when they are prolonged or recurrent; or are followed by signs of any of the unfavourable terminations noticed above, much *danger* should be apprehended. Indeed, all cases depending upon cerebral disease are attended by more or less danger, which, in some instances, become most imminent, particularly when the symptoms of hydrocephalus are present. — *b.* In *adult persons* the prognosis is equally *unfavourable*, when the affection is evidently the result of cerebral disease, or of organic changes — and when the fits become more and more frequent, or severe, with more marked cerebral disturbance, either attending upon, or following them. On the other hand, when they are symptomatic of disorders of the *prima via*, or of the generative organs, a *favourable* opinion may be entertained. — *c.* *Puerperal convulsions*, however, should never be considered devoid of *danger*, more especially when they occur after delivery; or in consequence of great exhaustion of vital power, or of uterine hæmorrhage. When they are slight, are unattended by stertorous breathing, or by paralytic or apoplectic symptoms, and when parturition is so far advanced as to readily admit of its completion by art, less danger may be feared. But the *prognosis* of convulsions generally must be inferred from a careful review of the diversified circumstances of individual cases, especially in respect of their remote and efficient causes, and of their disposition to terminate in either of the ways pointed out.

40. IV. APPEARANCES ON DISSECTION OF FATAL CASES. (See BRAIN, § 4—133.), EPILEPSY, and SPINAL CHORD.

41. V. REMOTE AND EFFICIENT CAUSES. — *i.* The *remote causes of convulsions* are numerous; but they often require a certain *original* or *acquired predisposition* of system to insure their operation; and various influences which may only predispose to them in some persons, may even excite them in others. *A. Predisposing.* There is every reason to suppose that the offspring may derive constitutional predisposition to convulsions from the parents. Persons of a nervous and irritable temperament, — of a delicate frame, and largely developed head (DESESSARTZ), — of a relaxed and soft fibre, and plethoric vascular system, — children whose fontanelles are very late in closing, — those who are naturally of a quick, sensitive, and unstable disposition, and whose physical and moral constitutions are readily impressed, — are predisposed by original conformation. Those infants who have experienced injury of the cranium during parturition (SMELLIE); persons who have early, prematurely, or inordinately indulged in venereal pleasures — who have placed no restraint on their passions, particularly anger, — who have become debilitated by any cause (AUTENRIETH), — who have had their cerebral organs unduly and too early excited, and before the process of developement was sufficiently far advanced; the present state of civilisation and precocious mental improvement; the greater irritability of the system accompanying the epochs of dentition; the irritable and plethoric states attendant upon pregnancy; habitual determination of blood to the head;

previous attacks of convulsion, either before or after puberty, or in a former pregnancy; attempts to conceal pregnancy, and the mental distress and shame attending it in unmarried women; exhaustion of nervous or vital power by increased discharges, long continued pain, or want of sleep; all luxurious indulgences; too much sleep; inanition and want; prolonged lactation; fluor albus, &c.; and certain electrical states of the air, by which the nervous system is influenced, and rendered more susceptible of impressions and excitement; are the chief causes which generate a predisposition in the frame. It has been remarked by Dr. RAMBOROM, and other writers, that puerperal convulsions were most frequently produced during warm electrical states of the atmosphere.

42. *B.* The *exciting causes* of the various forms of convulsion are very numerous; and they act in different ways in producing their effects. I have already stated, that irritation of a part of the organic or ganglial nervous system will be transmitted by the communicating branches to the spinal nerves, and produce convulsive actions of the muscles they supply, without the brain experiencing any evident lesion; whilst, in other cases, the irritation may be conveyed to the brain, either directly by the organic nerves, or through the medium of the spinal chord, the cerebral functions suffering accordingly. But irritation or organic change of any of the parts contained within the cranium will also occasion convulsion, the general sensibility and mental manifestations being then more or less obscured or perverted during the paroxysm or subsequently. These facts, which might be illustrated by numerous cases, the history and results of which I have attentively observed, naturally point to a division of the causes, *first*, into those which act upon some portion of the organic nervous circle, or the viscera which it supplies; and, *secondly*, upon the cerebro-spinal system itself. But, although it is useful to make this distinction, particularly for practical purposes, yet it should not be overlooked, that irritations affecting the former would rarely be followed by convulsions, unless the latter possessed a marked disposition to disease, as far as regards increased susceptibility and proneness to experience alterations from the healthy condition of its circulation.

43. *a.* The *exciting causes* which act more immediately upon the *organic nervous system*, and through it upon the spinal nerves or brain, or both, are the following: — *a.* In *infants and children*, the retention of the meconium; a morbid state of the umbilical chord; unwholesome milk, or improper feeding; acid or acridordes, and various diseases of the alimentary canal; an overloaded stomach; suppression or retention of the urine; accumulated flatus, or morbid secretions, and the presence of *worms*, occasioning irritation of the bowels; the ingestion of acrid substances — as very irritating purgatives (GOM and LENTILIUS), or emetics (RIBBLEN), — acid enemata; noxious or indigestible substances taken as food; acidity of the *prima via*; dentition at either of its epochs, particularly cutting the eye and molar teeth; the irritation of pained or carious teeth; and calculi in the urinary organs, &c. *β.* In persons about, or *subsequently to, puberty*, and occasionally in children, organic diseases of

find precisely that state which is described in the article BLOOD (§ 53—60.), and that, instead of congestion, there is general anæmia, with cerebral irritation, combining with the physical condition of the brain, to determine to it the greater part of the blood in the system. In other cases, there is apparently anæmia of the brain, at least at the commencement of the fit, and either consciousness is retained, or it is lost from the state of the cerebral circulation. These forms of seizure may be called *anæmial*; inasmuch as they arise either from a general deficiency of blood, or from anæmia of the brain, although the vessels of this organ soon become partially congested from the impeded respiration, and interrupted circulation through the lungs and heart, at the commencement of the paroxysm. In these, a very opposite treatment to depletion is required. The observations of LATHAM, HALL, GOOCH, NORTH, and the author, on this important practical topic, have, however, induced the practitioners of the present day to resort to blood-letting in convulsions in a much more discriminating manner than formerly.

50. *d.* Next in importance is the judicious employment of *cold* and *heat*—of cold in the form of cold affusion on the head and spine, and of heat in that of warm bath or semicupium. An appropriate use of these is more generally serviceable, and often less dangerous, than depletions. The *cold affusion* to the head, and, in cases where there seems to be irritation of the spinal envelopes, along the vertebræ; and cold, in the form of epithems, evaporating lotions, pounded ice to the head, when convulsions are produced by inflammatory action in the brain or spinal chord; are among the chief forms in which this agent is admissible. The *cold bath*, although advised by CURRIE, LOEFFLER, BEAUMES, BAYNARD, and others, is, in my opinion, a hazardous experiment during the paroxysm, and sometimes even in the interval. The *warm bath*, or *semicupium*, is frequently of much service, and particularly when there is either high nervous irritation; a dry harsh skin, or cold surface or extremities; and my experience accords with that of HEILBRONN, HENRISCHEN, DOERNER, and STUTZ, respecting the propriety of adding a quantity of the fixed alkalies, or their carbonates, to the water. When the head is much affected, either by inflammatory irritation of the membranes or active congestion, cold affusion, or cold epithems or lotions, may be employed whilst the patient is in the warm bath, or is using the semicupium or pediluvium. In slight cases of convulsion, the aspersion merely of cold water over the face, head, or neck, is often of service. Large draughts of cold water were recommended by HOFFMANN; and they, as well as water ices, and cold clysters, have been several times employed by myself with much benefit. Cold injections are praised by LANGHANS and MARX. Cold affusion, cold aspersion, and cold epithems, have been prescribed by CURRIE, DUPONT, DOEMLING, and others; but the two former were usually directed by them to the surface generally, instead of to the head,—a circumstance which accounts for the disuse into which it had fallen, when the practice was revived some years since by the author.

51. *e.* If the patient can swallow, and the muscles of the jaw are not much affected, *cathartic*

medicines should be given by the mouth; but in most instances it will be preferable to delay them until after the seizure. But I have under no circumstances been prevented from directing a cathartic and *antispasmodic* enema to be thrown up. Either of F. 131—136. may be employed and repeated, if it be not retained, as is frequently the case. When purgatives can be taken, a full dose of *calomel*, either alone or with jalap, followed soon afterwards by an active cathartic draught or mixture, consisting of senna, tincture of jalap, carminatives, and antispasmodics, particularly the preparations of ammonia and camphor, is, upon the whole, the most appropriate. But under every circumstance the operation of these should be promoted by enemata. When we wish to produce an active derivation from the head and spine, as well as alvine evacuations, the croton oil, elaterium, ol. terebinthinæ, &c., may be employed. But, where the object is chiefly to bring away offending secretions, and other causes of irritation, and at the same time to allay disordered action in the *prima via*, calomel, jalap, rhubarb, and senna, are, perhaps, the best purgatives we can employ. Their action will, in all instances, be much increased, and a marked change be often produced in the disease, by an occasional dose of the ol. terebinth. and ol. ricini, assisted by the enemata already recommended. If convulsions arise from *worms* in the intestines, *anthelmintic* purgatives, during both the paroxysms and interval, should not be omitted. Calomel may generally, with due address, be exhibited during the fit, and subsequently other anthelmintics may be given. BERGIUS and BARTON prefer the *Spigelia Marylandica* in such cases; but the other means adopted in verminous disorders may be employed according to circumstances. *Emetics* are sometimes of service, when exhibited upon the first intimation of the seizure, particularly if there be indications of gastric irritation from offending or noxious ingesta, and acid sordes, or if the paroxysms assume a periodic form. SCHENCK, SCHÆFFER, RIGEL, CONRADI, HUFELAND, and SMITH, advise them chiefly in such cases. THOM recommends them to be exhibited to the nurse, when convulsions attack infants.

52. *f.* *Antispasmodics* are sometimes productive of instant relief, when employed in large doses, early in or upon the first intimation of the fit, particularly when it arises from debility, or irritation in the *prima via*, or morbid nervous susceptibility; but they seldom can be taken in the paroxysm, unless it be slight, or arise from exhausting causes, and then they are often of great service, especially if they be combined with restoratives and opium, conium, or hyoscyamus. The æthers, camphor, musk, assafoetida, valerian, the preparations of ammonia, bismuth, zinc, &c., are amongst the most efficacious in these cases. When inflammatory irritation seems to exist in the membranes of the brain, they are obviously contra-indicated; but congestion of a passive nature, especially when the pulsations of the carotids are not strong or hard, and the temperature of the head is not increased, should be no reason for omitting them. An extensive experience, however, of the effects of the spirit of turpentine in convulsive diseases, has convinced me that it is the most efficacious

epithems, and internal and external revulsants, if it exhibit appearances of congestion or inflammatory irritation; and warm diaphoretics, gentle tonics, and antispasmodics, and other means of supporting the manifestations of vital power in the nervous systems, and of promoting the secreting and excreting functions.

56. *k.* When convulsions are produced by narcotic or acro-narcotic poisons, the immediate evacuation of the noxious substance by the stomach pump, or by emetics, the cold affusion on the head, followed by stimulants and antispasmodics, green tea, or coffee, stimulating enemata, and frictions of the surface, are chiefly to be depended upon. If they proceed from the fumes of lead or mercury, antispasmodics, tonics, stimulants, strychnine, or nux vomica, with purgatives, are most serviceable, particularly when assisted by the warm bath, and by frictions of the surface afterwards with stimulating liniments. *Serpentaria*, the *arnica montana*, and camphor, are often beneficial remedies in those cases.

57. *l.* Convulsions either of a partial, a general, or irregular and anomalous form, arising from irritation of the female organs, require local depletions, cooling aperients, and antispasmodics; the internal use of soda and nitre; cold clysters; the cold affusion or aspersion; the tepid bath; or the shower bath, while standing in warm water; and draughts of cold water. In a case of general convulsions arising from inflammatory irritation about the neck of the uterus, with leucorrhœa, I directed the patient to take a lemon ice, or to drink as much as she could of cold spring water upon the intimation of the seizure; and she has hitherto done so with uniform benefit. Having seen her during the paroxysm, and perceiving that she retained her consciousness, cold water was given, and swallowed with some difficulty. The benefit was almost instantaneous. If the convulsions be connected with difficult, or suppressed menstruation, general or local depletions, and afterwards the warm general or hip bath, full doses of the preparations of assafoetida and ammonia, particularly the tinct. ammon. comp., the spir. ammon. foetid., or the tinct. guaiaci composita, also camphor, and the boracic acid, or the borate of soda, have proved the most effectual remedies in my practice. But the means already advised to prevent congestion or irritation within the cranium, should be resorted to upon the first intimation of the fit. Bleeding by leeches from the inside tops of the thighs are indicated in these cases; but it can be practised only in the interval.

58. *B.* The prevention of the paroxysms is to be attempted, with due attention to the remote and proximate causes, the former of which should be removed as completely as possible, and the latter energetically but cautiously combated; recollecting always that convulsions are the outward manifestations of certain lesions of the nervous, acting on the muscular, functions; and that our knowledge of such lesions extends not beyond the inference that they consist of depression or exhaustion of vital power, or of irritation, or of congestion, and occasionally, of two or all these states conjoined, some one of them predominating over the others, and being associated with additional and even opposite changes. Many of the

means already noticed are requisite in the intervals, as well as in the paroxysm, especially when judiciously modified to the circumstances of the case. *a.* *Vascular depletion* is often required, and in similar states of disease to those already pointed out; but it should be directed with great circumspection, and to a moderate extent, unless the signs of active cerebral congestion, or of inflammatory irritation, or of general plethora, be unequivocal. If, however, opposite states obtain, viz. exhaustion, and deficiency of blood, very different means must be employed. In most instances of convulsions, the quantity of the circulating fluid is not so frequently either much above or much below the usual proportion, as the influence, — vital or nervous, or by whatever name it may be called, — by which the distribution of blood throughout the frame is regulated, is disturbed so as to determine or attract a larger proportion to one part than to another. In no peculiarity of constitution is the old doctrine, "*ubi irritatio, ibi fluxus*," more frequently illustrated than in that in which convulsive complaints are most commonly observed; and, in these diseases, we are continually finding fluxion one of the earliest consequences of irritation. I have long thought, and on several occasions contended, that, in the common routine of practice, blood-letting is too indiscriminately employed to remove such determinations or irregular distribution of the circulating mass; and that, although it sometimes succeeds, owing to its being associated with other and more appropriate means, it often fails, or even augments the mischief, by increasing the debility and susceptibility of impressions from exciting or irritating causes, that generally characterises the nervous system of persons subject to convulsive seizures. Therefore, when the abstraction of blood is really necessary, it should be performed in such a manner, and be accompanied with, or followed by, such medicines as are most likely to equalise the circulation; and it is chiefly in this way that many of those about to be noticed are productive of any service in the disease. Local depletions, in moderate quantity, repeated according to circumstances, — from the nape of the neck or occiput, when the head is affected, and along the spine, if irritation of the membranes of the chord is suspected, — and assisted by such other means as the case may require, are more generally applicable in the intervals than large venesections.

59. *b.* There are few remedies more beneficial in convulsions than mild purgatives, or aperients, taken daily, and conjoined with tonics and antispasmodics. Active purgation, if long persisted in, will lower the vital energy, and thereby favour the return of the fits; but the more deobstruent and eccoprotic medicines of this class, particularly when thus combined, may be given, so as to procure two or three saculent evacuations daily. Thus prescribed, purgatives will increase the patient's strength, and often procure a prolonged immunity from the seizures. *Aloes*, with quinine or iron, and camphor; or with myrrh, assafoetida, the tonic extracts, &c., and occasionally with blue pill, or with extract of hop, hyoscyamus, or conium (F. 450—471.); *senna*, with gentian or bark, the preparations of ammonia, æther, &c. (F. 266. 872.); and either

upon the inside of the thighs, or on the epigastrium, or along the spine. Several writers have directed blisters to the head; but the pathological states admitting of their application in this situation are comparatively rare, and require the most intimate knowledge of disease, and appreciation of symptoms for their recognition. It is only when the vital energy of the brain is profoundly sunk or exhausted, and not suppressed by congestion, or active determination of blood, or the pressure of effused fluids, or adventitious formations, that a blister on the scalp can be of any service. When applied to the nape of the neck, or behind the ears, or between the shoulders, they are seldom of much use, unless kept open for some time. The pea or mezereon issue in the insides of the thighs, and antispasmodic liniments or plasters along the spine, or over the epigastrium, are sometimes useful auxiliaries.

64. *g. Electricity and galvanism* have been proposed in convulsions; but I agree with GRAFINGESSER in thinking them hazardous. *h. Cold bathing* has been very commonly recommended; but it requires discrimination. It will benefit chiefly those cases which are unconnected with organic lesion, and which depend upon general debility and susceptibility of the nervous system. In these the salt water bath should be preferred, and its use commenced in the tepid state, the temperature of successive baths being gradually reduced. The cold shower bath is more generally applicable, particularly upon getting out of bed; and when it cannot be resorted to, the patient ought to sponge or bathe the whole head with cold water every morning. The strictest attention should, at the same time, be paid to the state of the digestive functions, and of the alvine evacuations. Cutaneous excretion also ought to be promoted; for, not only are all the other functions thereby improved, but contingent disturbance of any of them, and the irregular distribution of blood, in which convulsions often originate, are less likely to take place whilst the circulation in the surfaces is uninterrupted. It is probably from this mode of operation, as much as from their antispasmodic action, that service has been obtained from several diaphoretics, particularly the *kermes mineral*, and other antimonials, recommended by UNZER, GULBRAND, STRUVE, and HARDER. *i. Warm baths, hip baths, semicupium, &c.*, when any advantage is derived from them in the intervals, act chiefly in this manner. But I believe that they will seldom be productive of much benefit, unless in cases connected with suppressed eruptions, or the exanthemata, or with irregular or difficult menstruation, and with disorders of the digestive canal in children; and in these the effects of warm baths will be much enhanced by stimulating or irritating frictions of the surface immediately upon coming out of them.

65. *k. The almost epidemic prevalence of convulsions during states of religious enthusiasm and mental excitement*, as shown by the occurrences already referred to (§ 16—18.), and by the seizures that affected many of the Jansenists who made pilgrimages to the grave of Deacon Paris, during the persecution of this sect in 1724, as well as by the convulsions at one time so uncommonly frequent in the Methodist meetings in various parts of Cornwall, as described by Mr. CORNISH,

should lead the physician to recommend such moral regimen as the circumstances of particular cases may seem to require. The above facts, as well as the circumstances recorded by BOERHAAVE, of almost all the girls and boys in the hospital of Haerlem being seized by convulsions from their seeing a girl who had been frightened into them, will alone show the importance of separating the affected from females or other susceptible persons. There can be no doubt that simple hysterical or epileptic convulsions occurring in one among a crowd of females will often occasion convulsive seizures in others, particularly in those of a delicate frame and nervous temperament, although they may have never previously been similarly disordered. I have met with such an occurrence more than once. Indeed, the number of these attacks on the public occasions referred to, is a sufficient proof both of the influence of the mind in producing them, and of the propriety of the immediate separation of a person thus seized, as was judiciously and successfully practised by Dr. HAYGARTH. The propensity to become affected by convulsions from seeing one in a fit appears to have been well known to the Romans, and from its frequency on occasions of public assembly, as much as from other considerations, they obtained the name of *Morbus Comitialis*, which has been understood as applying only to epilepsy, but which I believe had a much wider signification, and comprised all convulsive seizures. That fear or terror will not only occasion convulsions, but also remove them, or at least often prevent their accession, might be inferred *a priori*, even if it were not proved by experience. The actual cautery employed by BOERHAAVE soon put a stop to them in the hospital at Haerlem: and their prevalence in certain of the Zetland Isles was said to have been arrested by the unceremonious ducking inflicted upon two or three of those affected; the fear of being treated in the same way having effectually prevented others from being attacked.

66. *l. Regimen.* — The circumstance of those convulsions which arise in crowded assemblies from mental excitement and religious impressions being often ushered in by faintings, and signs of congestion of the cavities of the heart, of the large vessels, of the lungs, &c., should suggest the avoidance, by susceptible persons, of warm and crowded assemblies, where the foul and moist air conspires with moral emotions in depressing the nervous power, and in favouring congestions of the heart's cavities and large vessels; as well as the propriety of removal to the open air, and of having recourse to antispasmodic stimulants upon the approach of the sinking and oppression at the epigastrium and præcordia, which often usher in the fit. The importance of administering to the mental affections and emotions — of relieving as much as possible anxiety or despondency — ought to be pointed out to those concerned, and the patient encouraged strenuously to resist the invasion of the paroxysm. Persons subject to convulsions should never receive indulgence on account of them, but be made to know that they may be warded off, by not yielding to the feelings which often favour or produce them. Regular hours of rest, of recreation, and of eating, should be adopted; seden-

tary habits avoided; exercise in the open air taken daily, and both the mind and body duly occupied without fatiguing either the one or the other. In some cases, depending upon disease of the brain or its membranes, the appetite is morbidly increased, and much more food is taken than is requisite to the wants of the frame. Others are connected with indulgence in spirituous liquors. It is almost unnecessary to add, that unless these excesses be guarded against, and the diet and regimen duly regulated, medical treatment will not be efficacious.

67. ii. TREATMENT OF CONVULSIONS IN INFANTS AND CHILDREN.—A. Many of the measures already recommended in the paroxysm may be also employed in this class of patients; but in a suitable form and with strict reference to existing pathological states. Where we observe the indications of cerebral irritation and congestion (§21.24.), *cupping* on the nape of the neck, behind the ears or occiput; the *warm bath* or *semicupium*, with *cold affusion*; cold epithems, &c., on the head, the hair having been removed or cut close; a dose of *calomel*, or of calomel and scammony if the child can swallow, and a *cathartic and antispasmodic injection*; are suitable remedies. The jugular vein may be opened in robust or well-grown children; but care should be taken not to bleed them to syncope, as a return of the convulsions may be thereby occasioned. Children ought to be bled with great caution during a fit; for, although I cannot go so far as to say, with HARRIS, that it is dangerous to bleed in the paroxysm, yet I believe that the convulsions will occasion a hurtful quantity of blood to flow without any immediate effect, if the evacuation be pushed with the view either of subduing them, or inducing syncope. It is as improper as it is futile to lay down any rules as to the extent to which depletion may be carried. It is obvious, that when the child is plethoric, the head large and hot, the eyes suffused and prominent, the carotids throbbing, &c., it may be practised freely, even in the fit, without risk.

68. a. Convulsions sometimes proceed from the nature of the ingesta. If this be the case, and if the abdomen be distended, an *emetic* should be exhibited without delay. Seizures not infrequently arise during the period of dentition from indigestible or irritating substances in the *prima via*, and in such cases often commence in simple flatulent colic. After an *emetic* has been exhibited, or even independently of it, a *purgative*, if it can be taken, should be prescribed, along with carminatives or antispasmodics, and a clyster thrown up. In cases of this description, I have found a dose of calomel, with soda or potash, or the hydrarg. cum creta, followed by either of the following mixtures, a carminative enema, and friction with an antispasmodic liniment on the abdomen or spine, the most successful means.

No. 158 R. Magnesæ Calcinatæ 3 ss.; Sacchari Albi ʒj.; Olei Anisi M℥v.; tere bene simul, et adde Aquæ Fœniculi Dul. ʒjss.; Spirit. Ammon. Fœtid. M℥xv.; Pulv. Rhei gr. xvj.; Syrup. Papaveris ʒij. Fiat Mist., cujus capiat coch. unum, vel duo minima, tertiis vel quartis horis.

No. 159. R. Olei Ricini ʒij.—3 ss.; Olei Terebinth. ʒj.—3 ij.; tere cum Vitel. Ovi, et adde Aq. Fœniculi ʒss.—3 j.; Syrup. Papaveris et Syrup. Rosæ ʒā 3 ij. M. Fiat Mist., cujus sumat partem quartam vel tertiam, tertiis vel quartis horis.

69. b. *Clysters*, containing valerian, assafoetida, or a terebinthinate substance, triturated with the

yolk of egg, and any of the carminative waters, to which oleum ricini or ol. olivæ may be sometimes added, are the most appropriate to those cases. Much discrimination is required as to the choice and continuance of cold applications to the head, particularly if the warm bath or semicupium be simultaneously resorted to. These combined means should never be left to the discretion of a nurse, at least without the personal superintendence of the practitioner in the first instance. In general, as soon as the temperature is reduced, and the features become pale and shrunk, or the fontanelle (if unclosed) level, or at all depressed, whether the convulsions, or sopor, when present, disappear or not, the application of cold to the head, in any form, should be left off, to be again resumed when the symptoms requiring it recur.

70. c. During dentition, or even before the teeth approach the margin of the gums, free *scarifications* ought to be practised, and repeated as soon as the scarified parts cicatrise, otherwise the obstacle to the passage of the teeth will be thereby increased. If general or cerebral plethora be not present, or has been removed, and the bowels have been fully evacuated, any of the alkaline or earthy carbonates, with aqua fœniculi, or aq. pimentæ, æther, camphor, &c., with the extract of conium or hyoscyamus, or the syrup of poppies, or small doses of laudanum, may be prescribed with the view of soothing the susceptibility and irritability of the frame at this period. Form. 347. 442. 865. have been ordered by me very generally in such cases, at the Infirmary for Children. In very young infants, convulsions may be occasioned solely by the retention and accumulation of acid and acid sordes in the *prima via*. These are readily removed by a dose of calomel, followed by oleaginous or other purgatives, the semicupium, and clysters. TISSOT and SHARP state that they have been produced by the retention of the meconium, owing to spasmodic stricture of the sphincter ani. This is, however, a rare occurrence. Emollients, oleaginous laxatives, the semicupium, clysters, and anodyne liniments, are appropriate to such cases. It has been repeatedly contended for by most of the older, although denied by many modern writers, that the anxieties, the more violent passions, and the irregularities of the nurse, may change her milk so as to disorder the digestive organs, and thereby give rise to convulsions in delicate infants. This fact is established by repeated observation. I perfectly agree with Mr. NORTH, who has taken a very judicious view of this subject, that it should never be overlooked. The obvious remedy in such cases is to change the nurse; and, if this cannot be done, to remove as far as may be the cause of disorder; to promote her digestive and excreting functions; to tranquillise or subdue any mental disturbance or febrile action that may affect the state of the milk, and to prescribe for the infant aperients with soda or ammonia, or other antacids and antispasmodics. I have often employed the oxide of zinc or trisnitrate of bismuth with soda, or the pulvis cretæ compos., and either the pulvis cacuanhæ comp., or small doses of conium or hyoscyamus, with much advantage in these cases, or simply the bi-borate of soda in camphor mixture, or aq. fœniculi.

71. *d.* The cold bath is a very doubtful remedy in the seizure: it is much less efficacious than the cold affusion on the head; and when the child retains its consciousness, it even sometimes aggravates the mischief. Of the recommendation of Dr. BROWN, to employ gradually increased pressure on the epigastrium during the fit, I have had no experience: it, however, deserves a trial.

72. *e.* Of the use of blisters in convulsions, as well as of alkaline rubefacients, as the liquor ammoniæ, no favourable idea should be entertained, as they require the utmost discrimination, and are far from being unattended by risk: for, although they will often cut short the paroxysm, yet they will also occasionally produce so violent irritation and inflammation as to be rapidly followed by sphacelation of the integuments. This is liable to happen particularly in ill or insufficiently fed, in delicate and irritable children; in those of a gross or fat habit of body, who have been allowed to feed upon the richer sorts of animal food too exclusively; in the state of vital exhaustion observed in the latter stages of disease, as well as in the early periods when the pulse is very quick, irritable, or sharp, the skin dry and burning, and the cerebral organs much excited or oppressed; — under such circumstances, I have usually directed a liniment composed of equal quantities of the liniment. saponis et opii (*Ed. Phar.*), and of the liniment. terebinthinæ, or either of F. 308. 311. to be rubbed on the epigastrium and abdomen, or along the spine. THUNBERG advises the cajuput oil to be applied to the epigastric region during the fit; HERZ directs the animal oil of dippel to the same region, and ABRAHAMSON the oil of rue. Either of these will frequently cut short the paroxysm, but I can assert, from a very extensive experience, that the liniments I have recommended are the safest and most efficacious.

73. *f.* When convulsions occur in the invasion of any of the *exanthematous fevers*, or upon the retrocession of the eruption, the treatment must depend, in a great measure, on the habit and strength of body, and the extent to which the brain is affected. If cerebral congestion or irritation, with general heat of surface exist, local depletions, the cold affusion on the head, whilst the patient is plunged in a warm bath, to which some vegetable or mineral alkali has been added, cooling aperients, cathartic injections, the tartar-emetic ointment and solution F. 749. rubbed on the spine, and diaphoretics, are generally most serviceable. After the bowels have been freely evacuated, the carbonate of soda and nitrate of potash, given in mucilaginous vehicles; the spirit. ætheris nitrici, with the liquor ammoniæ acetatis in camphor julep, &c.; may be prescribed. If the skin be cool, and the pulse weak, or if the fit have occurred after the disappearance of the eruption, salt and mustard may be put in the bath; and if the countenance be pale and collapsed, and the cerebral functions not materially disturbed, warm and cordial diaphoretics, as the preparations of ammonia, camphor, serpentaria, &c., exhibited from time to time. Frictions of the surface, immediately after the patient is taken out of the bath, will generally promote its good effects.

74. *g.* If convulsions occur in the course of *hooping cough* or *croup*, we may conclude that conges-

tion, or inflammatory irritation of the membranes of the brain, has supervened, and should direct local depletions, the cold affusion on the head, semicupium, and the carbonates of the fixed alkalies, with opium, hyoscyamus, or belladonna, in minute doses, unless the patient is already much reduced by repeated or large evacuations, when we may infer that the convulsive seizures are connected with anæmia, and should prescribe the treatment already described in relation to this state (§ 55.).

75. *h.* The convulsions which occur so frequently as a consequence of chronic or severe *bowel complaints*, and of exhaustion from other diseases, and which have been too frequently imputed to dropsical effusion in the ventricles, require cordial antispasmodics, tonics, and light nutritious diet. Although sometimes attended by more or less effusion, arising from the physical condition of the cranium and its contents, and serving to prevent any vacuum from being occasioned by the deficiency of blood in the cerebral vessels, yet the convulsions should not be viewed as proceeding from the effused fluid, but rather from the irregular and imperfect supply of blood to the cerebral structure.

76. *i.* The seizures that follow great losses of blood in children are generally characterised by too active determination of this fluid to the cerebral structure; and require the head to be kept cool and elevated, the bowels to be acted upon, and restoratives, antispasmodics, cordials, and tonics to be administered with the extract of poppies, conium, or hyoscyamus, according to the peculiarities of the case.

77. *k.* If convulsions follow the disappearance or repulsion of chronic eruptions, we should dread the existence of inflammatory irritation of the membranes of the brain or medulla oblongata or spinalis, with a tendency to serous effusion. Local depletions, the warm bath; frictions of the surface, particularly of the part whence the eruption had disappeared, with irritating liniments; the use of sinapisms, and deobstruent purgatives, as calomel, &c.; are chiefly to be confided in.

78. *l.* When the seizures have recurred several times, particularly in infants, and are attended by dilated pupil, squinting, slow pulse, &c., their connection with *hydrocephalus* may be inferred. In such cases, even local depletions should be employed with caution: but in many instances they may still be resorted to, in small quantity; and followed by alterative doses of calomel or hyd. cum creta, diuretics, small doses of digitalis with spirit. æther. nit. and the use of the liniment (F. 311.) to the head and loins both in the fit and in the interval.

79. *B.* The preventive treatment, — *a.* in *plethoric*, fat, and gross-living children, should chiefly consist of a proper regulation of diet, as advised by BEAUMES. Farinaceous food ought to be adopted, with only an occasional indulgence of the less stimulating meats. No rational plan of treatment, however, can be attempted with the view of prevention, without strict reference to the remote and proximate causes of the affection; the former of which should be carefully avoided, and the latter removed by suitable treatment. When we detect cerebral irritation, or determination of blood to the brain, or active congestion,

cupping, as already directed; the daily affusion of cold water on, and a constantly cool state of, the head; a moderate, but continued, action on all the secreting and excreting organs; tranquillity, and the abstraction of all excitement of the mind and senses; a bland and low diet; the use of revulsants, and warm clothing on the lower extremities; are the most appropriate remedies.

80. *b.* In very delicate children, where no evident inflammatory irritation within the head exists, a tonic treatment is obviously requisite. The sesquioxide or ammonio-tartrate of iron may be given, either alone, or with other antispasmodics, or any of the other preparations of this metal. The sulphate of quinine, or the preparations of cinchona, with liq. ammoniæ acetatis, and a little of any of the compound spirits of ammonia; suitable diet, attention to the state of the bowels, and change of air, will also be of service. Calomel, in frequently repeated doses, either alone or with purgatives or anodynes, has been most injuriously resorted to by practitioners, upon the mistaken notion that convulsions are always connected with irritation within the cranium, and that this medicine alone can remove this state; whereas, if calomel be prescribed in small and frequently repeated doses, it will actually increase the susceptibility and irritability of the body generally. When, however, it is given in full doses at distant intervals, or only occasionally, and either combined with jalap or some more active purgative, or followed by cathartics and enemata, it is a valuable remedy. Where the bowels are thus judiciously acted upon from time to time, and particularly if this be accomplished by a terebinthinated draught, tonics, combined with antispasmodics and anodynes, will be of the greatest benefit, especially if there be no disorder of the cerebral functions to forbid their exhibition. The sulphate or oxide of zinc, or the sulphate of quinine, or the oil or other preparations of valerian, or assafoetida, musk, &c., with either conium, hyoscyamus, or the extract of poppy; the tonic decoctions and infusions, with the alkalies; and various other remedies already recommended in the intervals (§ 61. 75.), may be severally employed, according to circumstances, after purgatives have been duly prescribed, and the stools have become natural.

81. *c.* When we have reason to infer that the convulsions proceed from *intestinal worms*, calomel with camphor, and the other cathartics noticed above; the occasional exhibition of an active terebinthinate draught, followed by enemata, containing aloes, assafoetida, camphor, &c., and subsequently, by the preparations of iron, as well as any other of the remedies and modes of combining them described in the article *Worms*, may be directed. It is generally remarked by the German writers, that worms never form in the alimentary canal previously to weaning, if the milk be healthy; and the observation is confirmed by my experience. It is therefore, after this period, that convulsions can be referred to this cause.

82. *d.* The marked *hereditary* and *constitutional tendency* to convulsions in the same family of children, and the very frequent connection of this affection with cerebral irritation, or with dropsical effusion in the ventricles, or between the membranes, in such cases, have presented

difficulties to every practitioner. I believe that the disease, when occurring in this manner, has been too frequently ascribed to inflammatory action, and a too lowering treatment adopted. Mr. HILL recommends the arsenical solution, with musk, in these cases; and I doubt not their utility, if carefully employed; but other tonics and antispasmodics, particularly the weaker preparations of bark or calumba, with the liquor potassæ, and small doses of conium, or syrup. papav., or opium, if the child be not too young, and if the watchfulness or erethism of the brain be present, will be found still more serviceable, especially if the head be kept cool, the secretions and excretions carefully promoted, and the kidneys occasionally excited by the addition of diuretics to the tonics, as the spir. æther. nit., digitalis, syrup. scillæ, &c., or by the application of a suitable liniment (F. 311.) to the loins. In several cases of this description, I have directed, after other means had failed, and while tonics, as now prescribed, were given, the hair to be cut off, and the liniment to be rubbed upon the head immediately after the cold affusion. In cases connected with inflammatory irritation of the membranes, local depletions, the cold affusion, &c. (§ 67.) should precede the above treatment.

83. *e.* The *diet and regimen* of children that have once experienced a seizure of convulsions, ought to be carefully attended to. The stomach ought never to be overloaded, either by the mother's milk, or by its ordinary food, which should be always recently prepared, and easy of digestion. As crying often brings back the seizures in infants and young children, it should be prevented as much as possible. When the bowels have been sufficiently evacuated by the medicines suggested, from one to three grains of the *hydrargyrum cum creta*, either alone, or with the carbonates of the fixed alkalis may be given at first every night and morning, and afterwards every night, or every other or third night. The head should be always elevated; and whilst in bed or indoors, it ought to have no other covering upon it than that with which Nature has provided it. On no occasion, should the warm fur or beaver hats, which are very improperly worn by children, be used; nor ought the mental powers to be prematurely or inordinately excited. In a word, the head should be kept always cool, the mind tranquil, the lower limbs warm, and the bowels open. A free, temperate, and healthy atmosphere, with occasional change of air is also as necessary as medical treatment.

84. *iii.* TREATMENT OF PUERPERAL CONVULSIONS.—The more frequent occurrence of convulsions in a first pregnancy, during a protracted labour in those who have experienced them previously; the period of the puerperal state, and the progress of the labour and state of the os uteri when they do occur; the characters they assume—whether those of eclampsia, of epilepsy, of hysteria, or of simple clonic convulsion; the causes which induce them, the circumstances connected with them, and the fact that they, more than any of the other forms of convulsion, are the result of active determination of the blood to the head—which, however, is merely the effect of irritation primarily seated in the abdominal viscera; are

all to be taken into consideration in the treatment of them. The intentions of cure are the same in this as in the foregoing states of convulsion; and they should be promptly fulfilled.

85. *A.* In order to cut short the seizure,—*a.* After having resorted to suitable means to protect the tongue, as the introduction of a cork between the teeth, &c., blood-letting from the arm, but preferably from the jugular vein, when it can be easily performed, should be employed, and carried at once to a decided extent relatively to the vigour and habit of body of the patient; and it should be repeated after a short interval, if the convulsions recur, and there be no circumstances to forbid it. Simultaneously with the flow of blood, or immediately after it, the affusion of cold water or the application of a bladder of pounded ice on the head, and the exhibition of ten grains of calomel, and from five to ten grains of camphor, previously reduced to a powder by a few drops of spirit, with or without an equal quantity of musk, and shortly afterwards of two or three drops of croton oil, should never be omitted. These medicines may readily be administered, by mixing them in sweet butter, and introducing a portion from time to time over the root of the tongue, upon the end of an ivory letter folder, or upon the handle of a spoon. A cathartic and antispasmodic enema (F. 141. 149.) should also be thrown up without delay; and immediately repeated, if it be returned. The combined effects of these will seldom fail of producing a solution of the paroxysm. My experience of the excellent effects of camphor is fully confirmed by Dr. HAMILTON, although CHAUSSIER expresses an unfavourable opinion of it, and of all heating antispasmodics; and the recently published observations of Mr. MICHELL are strongly in favour of musk, which he gives in doses of from one to two scruples. Depletion may be carried further in those states of the disease which assume the characters of eclampsia, or which are attended by great fulness about the head, or stertorous breathing, than in almost any other malady. CHAUSSIER advises, after general depletion has been practised, local bleeding from the nape of the neck and occiput, or from the epigastric region.

86. *β.* As to the propriety of prescribing opium in puerperal convulsions, very opposite opinions have been given. PETIT, HAMILTON, MERRIMAN, and DEWEES consider it most injurious; MANNING and BLAND recommend it, and LEAKE and BURNS, with a judicious discrimination, state, that when the disease is not accompanied with fulness of the vessels of the head, it may be exhibited with advantage after blood-letting. In this decision I concur, and add, that it should always be given either with camphor, as directed by STOERCK, or with the carbonates of the alkalies, as advised by STUTZ and BRUNINGHAUSEN, or with both; more particularly when the convulsions occur from excessive irritability, or previously to the period of full gestation, or after delivery, or when they assume chiefly the characters of hysteria. RINCK applies it to the abdomen, and HUFELAND to the soles of the feet.

87. *γ.* Some difference of opinion exists as to the propriety of exhibiting emetics in this disease. DENMAN is in favour of them, but MAURICEAU, CHAUSSIER, and HAMILTON condemn them, unless after blood-letting, and when the seizure has

been excited by improper ingesta,—the only circumstances under which, in my opinion, they should be given, and in which Dr. BLUNDELL also recommends them. Of the good effects of active cathartics there cannot be the least doubt. I have always observed, as Dr. MERRIMAN has stated, that the stools procured by them are morbid and offensive.

88. *δ.* The next practical point of importance is, whether or not the patient should be immediately delivered; and on this the sentiments of the most eminent accoucheurs are at apparent, rather than actual variance. No person will deny that the state of the uterus is connected with the cause of the seizure; therefore it would obviously seem requisite to remove that state. But the objectors reply, that convulsions also occur after delivery, when this state of uterus no longer exists: I have, however, never met with any, of several cases of convulsions after delivery for which I have prescribed, that did not arise from analogous causes of irritation, viz. an over-distended urinary bladder, the retention of the placenta or of coagula in the uterus, or the accumulation of fæcal or irritating matters in the bowels. I therefore would adhere to the opinion I have often given, namely, if the above means have failed, and if the labour be so far advanced as to enable the accoucheur to deliver immediately without force or injurious interference, then let it be done. If the labour be not so far advanced, but yet the os uteri is considerably dilated, then the membranes may be ruptured, particularly if they be very tumid,—if, indeed, they have not been already ruptured, which is often the case,—and either full doses of the biborate of soda (ʒj. to 3ss.) given, or the ergot of rye. If the os uteri be rigid or undilated, the former of these will be preferable. If, however, the labour has not proceeded far, then any interference, excepting by the exhibition of medicinal substances, may be more injurious than beneficial. LA MOTTE, OSBORNE, LEAKE, HAMILTON, DUBOIS, ASHWELL, NAUCHE, MIGUEL, BURNS, OSIANDERS father and son, DUCES, and RAMSBOTHAM, are favourable to as early delivery as possible without violence; whilst BLAND, GARTHSHORE, BAUDELLOCQUE, HULL, GARDIEN, DENMAN, and BLUNDELL, are against forcible dilatation of the os uteri, and attempts at delivery in the early stage of labour. After all, the difference is more in words than in intention; for the general object is to hasten delivery, without injurious interference, if the labour be so far advanced as to render the attempt prudent; and those who have espoused either side have stated their opinions with such exceptions and limitations, and with so little precision, as to leave the subject nearly where they found it, and to render it no easy matter to ascertain under what circumstances they would either have recourse to art, or trust to nature. When the treatment already recommended fails, or is followed by an exasperation of the convulsions,—which will very seldom occur if it have been judiciously directed,—then I conceive that the active interference of art should be called to our aid. There is, perhaps, no subject on which opinions are stated to be so much at variance as on this,—each succeeding writer placing those of his predecessors in opposition, even where no real

difference exists, and thereby bewildering the inexperienced, in order that he may have the credit of giving a decision respecting it.

89. *s.* CHAUSSIER recommends, in rigidity of the uterine orifice, the application of a pomade containing *belladonna*, with a view of relaxing the spastic contraction, which, he states, is not limited to this part, but extends to the whole of the organ. I believe, however, that the body of the womb is generally free from spasmodic contraction. This preparation consists of two drachms of the extract of this narcotic, softened with an equal quantity of water, and triturated with about an ounce of prepared lard. A piece, the size of a small nut, is to be introduced into a female syringe, open at the extremity, and conveyed to the os uteri, where it is to be applied by pushing onwards the piston. In about half an hour the rigidity subsides, and the labour proceeds. Of this practice I have no experience. M. CHAUSSIER discourages any other attempt at dilatation of the os uteri, as irritating the parts, and inducing a recurrence of the convulsions.

90. *ζ.* I have never omitted, in any case treated by me since 1819, to employ the effusion of a stream of cold water on the head, and the injection of turpentine clysters, sometimes with camphor, assafoetida, or valerian, and the results have been most satisfactory,—a much less quantity of blood having been detracted than is usually required in such cases. I am not aware that either of these two remedies had ever been employed in puerperal convulsions, until long after I had given publicity to the practice,—a practice which I know to have been recommended very recently by those, who, at that time, ridiculed it. In the more rare states of the disease, which are attended by a weak quick pulse, pale features, and hysterical symptoms, enemata containing valerian, assafoetida, or camphor, are very serviceable. In those which assume the comatose or apoplectic characters, *blisters* applied to the nape of the neck, and *sinapisms* to the ankles and calves of the legs, are useful adjuvants of the measures already recommended.

91. *η.* In all cases occurring previously to, during, or after parturition, the state of the bladder, and of the bowels, ought to be carefully enquired into. Early in 1823, I was called to the Queen's Lying-in Hospital, by the house pupil, to a patient who had been seized with puerperal fever on the second day after delivery, but was convalescent from it, when she was attacked by convulsions, brought on by a distended urinary bladder. I found that the urine had been drawn off, and that she had been bled once largely. The case was one of extreme severity and danger; the convulsions were unremitting, and attended by profound coma and asphyxy. The vein was re-opened, and, while the blood flowed, a stream of cold water was kept playing upon the vertex, and, at the same time, a clyster with turpentine and camphor was thrown up. Thus, the three most powerful—the almost only, remedies to be confided in, were simultaneously in operation. The patient rapidly recovered. Purgatives were given by the mouth, upon the solution of the convulsions; deglutition having been entirely abolished during the whole seizure. This was one of the earliest cases in which I had ventured upon the simultaneous

employment of these powerful agents, the use of them in succession having been generally adopted by me previously. I allude more particularly to this case, because of its uncommon severity; of its occurrence soon after a most dangerous disease, as late as nine days after delivery, in a public institution, and at a time when my public recommendation of the practice apparently received but little attention; although it will not now be looked on with scepticism.

92. *θ.* Of other remedies but little may be said, as they should be viewed as auxiliaries merely. I have already expressed myself favourably of *camphor* (§ 85.). BURNS condemns it; but, when exhibited after depletion, and at the same time with the cold affusion on the head, and cathartic and antispasmodic clysters, it is a valuable medicine. Under the same circumstances, *must.*, *assafoetida*, and the other antispasmodics, will also be of use; for all risk of their injurious action on the brain is prevented by the cold affusion, whilst they co-operate with the terebinthinate injections to excite the contractions of the body of the uterus, and remove spastic constriction of its neck. Of the *ergot of rye*, my experience is limited. I have given it only in one case of this disease, and then it was combined with *biborate of soda*,—a medicine undeservedly fallen into disrepute—but which I have prescribed for many years. The labour in that case proceeded rapidly, and the patient recovered. Much difference of opinion exists as to the effects of, and propriety of giving, the *ergot* in convulsions. If the os uteri be dilated, and the external parts free from rigidity, blood-letting, the cold affusion, and cathartic injections, having been actively but unsuccessfully employed, there can be no doubt of the propriety of exhibiting it. Opinions will always be at variance as to the benefits derived from substances recently introduced into practice; for, as all medicines are remedies only from their appropriate use, experience of their operation is required to ascertain the circumstances in which they are truly of service. In a case of puerperal convulsions—I believe the first in which the *ergot* was exhibited—Dr. BRINCKLE gave it after the means usually adopted had failed. Twenty minutes after the first dose had been taken, uterine action came on, and the patient recovered. It is strongly recommended by Dr. WATERHOUSE, of Philadelphia, and by Mr. MICHELL.

93. *i.* In cases of unyielding rigidity or callosity of the os uteri, VAN SWIETEN advised an incision to be made through its margin. DRACOE, and, subsequently, LAUVERJAT, BODIN, and CORTOLY, who considered it perfectly justifiable after blood-letting, the warm bath, and other means usually employed, had failed, have had recourse to this operation. M. CORTOLY has recorded four cases (two of which are quoted by M. MIOUET) in which it was resorted to; three of these recovered. The death of the fourth he imputed to the circumstance of it having been too long delayed. M. NAUCHÉ also favours this operation in the above circumstances, especially if emollient and narcotic injections into the vagina have failed to relax the rigidity.

94. *κ.* The warm bath, and emollient fomentations, followed by the use of an anodyne liniment on the abdomen, have been recommended by DENMAN and NAUCHÉ; and the tepid bath by

From abscess of the ear; et *Horn's Archiv.* b. i. p. 329. — *Conradi*, in *Hufeland's Journ. der Pract. Heilk.* b. vii. st. 2. p. 6. — *Hargens*, in *Ibid.* b. vii. st. 1. p. 114. — *Doerner*, in *Ibid.* b. xv. st. 4. p. 94. — *Henrichsen*, in *Ibid.* b. xv. st. 4. p. 79. — *Michaelis*, in *Ibid.* b. iii. p. 344. — *Wiedemann*, in *Ibid.* b. vi. p. 418. — *Struve*, in *Ibid.* b. xxiii. st. 4. p. 8. — *Schmalz*, in *Ibid.* b. xi. st. 4. p. 169. — *Heithronn*, in *Hufeland und Harles N. Journ. der Ausl. Med. Chir. Lit.* b. ii. st. 1. p. 187. — *Powel*, in *Trans. of College of Phys. of Lond.* vol. iv. art. 8. — *Latham*, in *Ibid.* vol. vi. p. 248. — *Cornish*, in *Lond. Med. and Physical Journ.* vol. xxxi. p. 373. — *Loeffler*, in *Richter's Chir. Biblioth.* b. viii. p. 732. — *Krebs*, *Medicin. Beobachtungen*, b. ii. heft 2d. — *Sumeire*, in *Journ. de Méd.* t. xxi. p. 224. — *Dupont*, in *Ibid.* t. xxxii. p. 130. — *Parry*, *Mem. of Med. Soc. of Lond.* vol. iii. art. 8. (*Compression of the carotids.*) — *Bianchi*, in *Brera's Comment. Medici*, dec. i. t. ii. art. 2. — *Grapengiesser*, *Versuche*, p. 98. — *Plenk*, in *Abhandl. der Joseph-Acad.* b. i. p. 318. (*Ipecacuanha.*) — *Thunberg*, *De Oleo Cajuputi.* Ups. 1797. — *Herz*, *Briefe*, st. 1. art. 1. — *Abrahamson*, in *Meckel's N. Archiv.* b. i. st. 3. art. 21. — *Hufeland*, *Bemerkung. über Blattern*, &c. p. 349. — *Frankfurter*, *Med. Wochenbl.* b. v. p. 229. — *Savary*, in *Dict. des Sciences Méd.* t. vi. par. ii. p. 197. — *P. Jolly*, in *Dict. de Méd. et Chirurg. Prat.* t. v. p. 473. — *Naumann*, in *Encyclopäd. Wörterbuch der Med. Wissensch.* b. viii. p. 341. — *Thackeray*, in *Med. and Phys. Journ.* vol. x. p. 410., and vol. xii. p. 508. — *Barton*, in *Ibid.* vol. viii. p. 428.; *Edin. Med. and Surg. Journ.* vol. iii. p. 441. — *Clarke*, in *Ibid.* vol. v. p. 268. — *Hill*, in *Ibid.* vol. v. p. 318. — *Thomson*, in *Ibid.* vol. xiv. p. 614. (*Dissections in.*) — *Haygarth*, *Of Imagination as a Cause or Cure of Disorders.* Bath, 1800. — *Portal*, *Anatomie Médicale*, t. iv. p. 69. et seq. (*Results of Dissections in.*) — *Dessensart*, in *Journ. de Méd.* t. xlvii. p. 114. — *Rinck*, in *Stark's Archiv.* b. v. p. 339. — *Kortum*, in *Hufeland's Journ. der Pract. Arzneik.* b. iv. p. 381. — *Cazals*, in *Journ. Génér. de Méd.* Dec. 1810, p. 371. (*Bismuth.*) — *Schaeffer*, in *Hufeland's Journ. der Pract. Heilk.* Feb. 1810, p. 105. — *Gebel*, in *Ibid.* b. xvii. st. 3. p. 103. (*Musk in large doses.*) — *Berge*, in *Med. Chir. Rev.* vol. xxv. p. 501. — *Denny*, in *Ibid.* vol. xxvii. p. 485. — *Lee*, in *Lond. Med. Gaz.* vol. xxi. p. 11.

ii. CONVULSIONS OF CHILDREN. — *Harris*, *De Morbis Infantum*, p. 102. — *Rosen*, *Traité de Malad. des Enfants*, 8vo. — *Beaumes*, *Traité des Convulsions dans l'Enfance*, 8vo. Paris, 1805. — *Capuron*, *Des Maladies des Enfants*, 8vo. Paris, 1813, p. 407. — *Gardieu*, *Traité de Malad. des Enfants*, t. iv.; *D'Accouchemens*, 3d ed. p. 239. — *J. Clarke*, *Commentaries on the Diseases of Children*, 8vo. p. 80. (*Too exclusively referred to cerebral irritation.*) — *Jacques*, in *Journ. Génér. de Méd.* t. xxix. p. 280. — *Bronn*, in *Ibid.* t. xxxi. p. 457. — *Piorry*, *De l'Irritation Encéphal. des Enfants.* Paris, 1823. — *Underwood*, *On Diseases of Children*, by *Merriman*. Lond. 1827, p. 233. — *Brachet*, *Sur les Convulsions des Enfants*, 8vo. Paris, 1824. (*A good book, with too partial a leaning to cerebral irritation.*) — *J. North*, *Practical Observat. on the Convulsions of Infants*, 8vo. Lond. 1826. (*An able and judicious work.*)

iii. PUERPERAL CONVULSIONS. — *J. Leake*, *On the Acute Diseases of Females*, &c. 6th edit. p. 338. (*Convul. from hæmorrh. and inanition well treated of.*) — *Manning*, *On Female Diseases.* Lond. 1775, p. 357. — *Denman*, *Introduct. to Practice of Midwifery*, 5th ed. p. 569. — *Hamilton*, *Edin. Ann. of Med.* vol. v. p. 318. — *Coutouly*, in *Journ. Génér. de Méd.* t. xxxii. p. 157. — *Pritz*, *De Convuls. Gravid. et Parturientium.* Wirceb. 1810. — *Michaelis*, in *Siebold's Lucina*, b. vi. p. 37. — *Brückmann*, in *Horn's Archiv.* Jan. 1811, p. 10. — *Gasc*, *Mémoires sur divers Points d'Accouchemens.* Paris, 1810. — *Gardien*, *Traité Complet d'Accouchem.* t. ii. p. 418. — *Stutz*, *Michaelis*, *Wiedemann*, and *Bruninghausen*, in *Hufeland's Journ.* &c. b. x. No. 4.; and in *Lond. Med. and Phys. Journ.* vol. v. p. 473. and 557. — *J. F. Oslander*, *Deutsche Zeitschrift f. Geburtskunde*, b. ii. st. 3. p. 538. — *J. L. Boer*, *Abhandl. und Versuche Geburtshuf. Inhalts*, &c. &c. 1791, b. iii. p. 192. — *Hufeland*, *Journ. der Pract. Heilk.* Dec. 1816. — *Wagner*, *De Eclampsia Exquisita in Partu.* Morb. 1817. — *J. Clarke*, in *Trans. of Irish College of Phys.* t. i. p. 381. — *Merriman*, *On Difficult Parturition, with Remarks on the Managem. of Labours*, 8vo. Lond. 1820, p. 135. — *Deveres*, in *Amer. Med. Record*, No. iii.; and in *Johnson's Med.-Chirurg. Rev.* June, 1820, p. 126. — *Brinckle*, *Philadelphia Med. Journ.* vol. vi. p. 126. — *Goupil*, in *Journ. des Progrès des Scien. Méd.* t. iii. p. 161. — *Duges*, in *Rév. Méd.* t. i. 1826, p. 378.; et *Manuel Obstét.* Paris, 1830, p. 275.; et *Dict. de Méd. Prat.* t. vi. p. 537. — *Chaussier*, *Sur les Convulsions qui attaquent les Femmes Enceintes.* Paris, 1824. — *Miguel*, *De Convulsions chez les Femmes Enceintes, en Travail*, &c. 8vo. Paris, 1824. — *Blundell*, *Lectures*, in *Lancet*, vol. xiv. p. 484. et 513. — *Burns*, *Principles of Midwifery*, 6th ed. p. 484. — *Ryan*, *Manual of Midwifery*, 2d ed. p. 285. — *Mitchell*, *On Difficult Parturition, and the Use of Ergot of Rye*, &c. 8vo. 1824. — *Nauche*, *Des Maladies prop. aux Femmes*, &c. 8vo. Paris, 1829, p. 449.

CORPULENCY. See OBESITY.

COUGH.—SYN. Βήξ, Gr. Tussis, Lat. Ber, Good. Pneusis Tussis, Young. Der Husten, Germ. Tour, Fr. Tossa, Ital.

CLASSIF.—2. Class, Diseases of the Respiratory Function; 2. Order, Affecting the Lungs (Good). II. CLASS, III. ORDER (Author).

1. DEFIN. Violent and sonorous expulsion of air from the lungs, preceded, rapidly followed by, or alternating with, quick inspiration.

2. I. PATHOLOGY.—Dr. CULLEN and several other nosologists have considered cough as chiefly a symptom, which undoubtedly it is most frequently; but I agree with Dr. YOUNG and Dr. M. GOOD in believing that it is entitled to be viewed on some occasions, as an idiopathic affection. Dr. GOOD, however, has ranked it as a genus, and comprised under it various affections, which are either merely slight forms of BRONCHITIS, or the results of organic changes in the LUNGS, and which I have treated of in these articles, and in those on BRONCHORRHEA, CATARRH, and INFLUENZA. He has, moreover, subdivided it into more varieties than can easily be recognised in practice, and has viewed HOOPING-COUGH as a species of the genus, instead of a distinct disease.

3. CAUSES.—Cough, in either of the forms about to be particularised, commonly attends disorders of the air-passages, and of parts in their vicinity, particularly of the larynx; also those of the lungs, and their membranous coverings; and sometimes diseases of other organs by which the respiratory functions are affected sympathetically—or rather, from continuity of tissue or nervous communication. It is thus occasioned by affections about the fauces, tonsils, pharynx, and neck; by the irritation of dentition; by diseases of the œsophagus, particularly when inflammation and ulceration of this part extends to, or penetrates, the membranous part of the trachea (KAPPELHOUT, Mr. BYAM, and myself); diseases of the spine and its contents (WICHMANN); by cretaceous or calcareous formations in the ramifications of the bronchi (MORAGNI, BONET, BAILLIE, PORTAL, and myself in several cases, two of which occurred in gouty subjects); by all organic changes of the thoracic viscera; by the accidental passage of foreign substances, solid or fluid, into the air-passages; by the lodgment of the eggs or larvæ of insects in the same situation (VOGEL and PERCIVAL, &c.); by the irritability of parts attendant upon the nervous temperament and debility; by the influence of irritation and imagination,—a cause which did not escape the observation of the acute MONTAIGNE; irregular or misplaced gout; the irritability of the parts continuing some time after measles, or inflammations of the air-passages or lungs; disorders of the digestive organs, particularly the stomach and liver, &c. (WINTHER, STEIN, PERCIVAL, &c.); by accumulations of bile in its receptacle; by the irritation of worms; by the repulsion of cutaneous eruptions, and the healing of old sores, and suppression of chronic or accustomed discharges. From this enumeration it is evident that cough is chiefly a symptom of numerous pathological states, which will be found very fully described under different heads, as indicated above. The epidemic cough noticed by some writers falls under the article INFLUENZA. In the act of coughing, the

M. DE SAUSSURE, ACKERMANN, FODÉRÉ, IPHOF, ERHARD, the WENZELS, and KNOLZ, have given us the best description of this state of mental and bodily deformity, in respect both of its nature and causes. The brief account of it by Dr. GOOD is both imperfect and erroneous, and must have been written in perfect ignorance of the descriptions of the above eminent observers, as well as of others deserving of perusal. He very inaccurately associates it with bronchocele on the one hand, and with rachitis on the other, with the former of which it is not necessarily, although very frequently, connected, and from the latter it is totally distinct.

3. I. DESCRIPTION. — Cretinism presents various modifications in kind, and every intermediate grade between that extreme degree of physical and mental debasement which is characterised by the utmost deformity and entire absence of mental manifestation, the organic or vegetative functions only being performed, and that condition which may be considered as very nearly approaching the healthy constitution of man. There are certain circumstances which distinguish cretins from other idiots, viz. *a.* They present certain bodily deformities, which are seldom or never observed in other idiots; and, *b.* Their physical and mental infirmities are always the result of endemic causes.

4. In general, some degree of goitre is attendant on cretinism, but not invariably. Professor KNOLZ states, that it is sometimes absent, and occasionally slight, the thyroid gland being enlarged in no greater proportion than several other glands are in the same subject. The stature is seldom above four feet and a half, often much less; the cranium is deformed and has a conical shape — the forehead being thrown backwards, narrowed, and flattened, and the occiput being nearly on a line with the neck; the flesh is soft and flaccid; the skin wrinkled, yellowish, or pale and cadaverous, dirty, and covered by chronic eruptions; the tongue is thick, and hanging out of the mouth, which is open, large, and slavering; the lower jaw is elongated and prominent; the eyelids are thick, the eyes red, small, but prominent, watery, and frequently squinting; the nose is flat; and the whole countenance is idiotic or expressive only of lasciviousness. The belly is large and pendulous; the neck either short and thick, or long and thin; the limbs crooked, short, distorted, &c.; and the gait imperfect and waddling. The senses are more or less defective, or altogether abolished; the cretin being often deaf and dumb, and those who possess the faculty of speech expressing themselves imperfectly and with difficulty. The intellectual functions are either entirely absent or imperfectly developed, whilst the organic or vegetative functions are in a state of increased activity: cretins being voracious, lascivious, and addicted to masturbation. They appear to have no other enjoyment than eating and sleeping; and their insensibility is often so great that they obey not the calls of nature. In some instances, the bodily deformity is not so remarkable as that now described; imbecility, flaccidity of the soft solids, with bronchocele, constituting the extent of infirmity.*

5. The cretin, like most idiots, seldom attains an advanced age; indeed, few of them reach upwards of thirty years. CLAYTON remarks, that although they die early, they soon present the appearance of age. They are usually of the lymphatic temperament, with light hair and grey eyes; the female cretin having enormously large and pendulous breasts. The less debased among them marry, rarely with one another, but do not propagate cretinism, the predisposition only to it being derived by the offspring from the parents. MALACARNE (*Mém. de l'Acad. de Turin*) attributes the mental debasement to the contraction of the bones of the cranium, which prevents the cerebral organs from acquiring their natural dimensions and functions; and ACKERMANN espouses a nearly similar opinion. The conformation of the body is generally stated not to be congenital, although, at birth, the cretin may appear weak, puny, or sickly. It usually comes on gradually from birth; and M. DE SAUSSURE states, that children who, living in the localities where it is endemic, and are not affected at eight or ten years, generally escape it; and that infants who are brought into these districts at a very early age, are equally subject to it with those who are born in them.

KNOLZ: — The whole body is stunted, its height not exceeding four feet. There is a total want of due proportion between its different parts: the height of the head, with reference to the rest of the body, being 1-4th or 1-5th, instead of 1-8th, the natural proportion. The neck is strong, and bent downwards. The mammae are very voluminous and pendent; the upper limbs reach below the knee, the arm is shorter than the fore-arm; the chest narrow, the abdomen hemispherical, and of a length not exceeding the height of the head; the penis and scrotum come down to the knees; the thighs are, with the haunches, of a greater width than the shoulders, and are shorter than the legs, the calves being almost wanting; the foot is small, and the toes partly distorted; the lower extremities are shorter than the upper half of the body. In the head, the masticating organs, the lower jaw, and the nose, preponderate considerably over the organs of sense and intelligence. The skull is depressed, and forms a lengthened and angular ellipsis; the receding forehead presents, internally, large frontal sinuses, to which the brain has yielded a part of its place; the top of the head is not vaulted, but flattened; the occiput projects but slightly, and runs almost even with the nape of the neck, as in ruminating animals. The face is neither oval nor round, but spread out in width; the parts of which it is composed being wide and short, and the maxillary bones projecting greatly. The forehead is narrow, flattened, and low; the eyes are unusually far apart, diverge slightly, and are small, and seated deep in the orbit; the pupil is contracted, and very sensitive to light; their external angles are situated higher than the internal; the eyelids, unless when dropsically swollen, are flaccid and pendent; the look is a fixed stare without expression, and turns with indifference from all that is not eatable. The root of the nose is widened and depressed, the bones of the nose square, the zygomatic bones are wide, and extremely projecting; the external ear is large, stands out from the head, and hearing is very defective. The elongated form of the lower jaw of the cretins, and their thick and padded lips, make them resemble ruminating creatures more than man. The tongue is thick, and rather cylindrical than flat; the saliva is continually running from the angles of the mouth. Enlargement of the thyroid gland is recognised as one of the signs of cretinism; but as this is no sure guide to the extent of the existing infirmity. The throat presents, also, other obstructed glands. The thorax is generally narrow and flat; the abdomen is usually distended with gases, and largely developed towards the chest; the flesh of the extremities is flaccid. The knee of an irregular shape, and usually bent. The fingers are very long and lank, and the nails very small. The upper part of the vertebral column being directed more or less forward, and the lower part, with the bones being pushed backward, the sacrum assumes a more horizontal position, than in the healthy formation. Besides the masticating and digestive organs, those of generation are also strongly developed, especially in the male. (*Monat. Jarbucker des k. k. Oesterr. Staates*, b. I. st. I. 1823, p. 25)

* The following account of the "*Feres*," or cretins of Salzburg, is abridged from that given by Professor

6. II. **CAUSES.**—The principal, if not the only, cause of cretinism is dwelling, during infancy and childhood, in deep, narrow, moist, and malarious valleys, situated at a lower level than 3000 feet above the ocean, where the air is stagnant, and the solar beams intercepted by the mountains. MM. FERRUS, GEORGET, and the authors already referred to, state, that cretins become numerous in proportion as the valleys sink below this elevation. In addition to those causes, may be added the poverty, ill-feeding, drunkenness, indolence, dirtiness, sensuality, and low debauchery of the parents, — circumstances tending to the production of an infirm and deformed offspring; the inactivity and filth into which children who begin to evince signs of cretinism are allowed to sink, and the influence of water holding calcareous and other mineral substances in solution. MM. DE SAUSSURE and FODÉRÉ, however, deny that the water is concerned in the production of this infirmity; but MM. BALLY and RAMBUTEAU show that much is owing to it in the causation of cretinism, as well as BRONCHOCELE (see that article). The last named authority states that the offspring of the natives of Valais, who intermarry with persons from the Italian side of the Alps, are more subject to cretinism than those born of native parents; that females who have husbands from the higher Alps seldom have children affected by this infirmity; that wherever cretins are seen, goitre is also prevalent; but that the latter is found in places where the former does not exist; and, consequently, that the same causes that occasion goitre, when present in an intense degree, also produce cretinism.

7. III. The **TREATMENT** of this infirmity is necessarily preventive rather than curative, and consists of the amelioration of the physical and moral condition of the parents; of the removal of infants, as soon as signs of the malady manifest themselves, to more elevated and open localities, and to mountainous districts, to enjoy a purer air and stronger light; of obliging them to exert themselves in some useful and suitable employment, and to pay attention to personal cleanliness; of frequent ablutions, followed by active and stimulating frictions of the whole surface of the body; of the use of stimulating tonics (ERHARD); and of allowing them a stimulating and strengthening diet, with a large proportion of animal food. JOSIAS SIMLER, who wrote in 1574, states that the malformation, constituting the physical infirmity, is sometimes congenital; and probably it is so occasionally. In such cases, it is not likely that much advantage will accrue from any means. M. RAMBUTEAU, however, states that it is scarcely ever congenital; but it is not unlikely that experienced observers may predicate, from the appearance of the newly born infant, whether or not it is likely to become the subject of this dreadful infirmity — may observe that state of developement and formation, which, if not actually the incipient malady, is predisponent to its occurrence.

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CRISIS.—**SYN.** κρίσις, a judgment or decision (from κρίνω, I judge or determine). *Judicium*, *Judicatio*, Lat. *Entscheidung der Krankheit*, Ger. *Crise*, Fr. *Crisi*, Ital.

CLASSIF. — PROGNOSIS.

1. Crisis may be defined a sudden change during the height of a disease, tending either to recovery or to death. Critical changes have been much regarded in the prognosis and treatment of diseases, from the time of HIPPOCRATES, who first mentioned them, and the days on which they occur, down to the present period. ASCLEPIADES, and the methodists, however, denied their influence, and disputed the existence of critical days. GALEN and his followers attached great importance to them. It is recorded, that, having been called to a patient — a young man — with two disciples of THEMISON, GALEN prognosticated a favourable change by a critical hæmorrhage. The opinion was ridiculed by the two methodists, who advised blood-letting; but it was soon verified, for the patient had a copious epistaxis, after which he recovered. It is unnecessary to allude to the writers who have contended for the importance of this subject: they comprise most of the eminent names in medicine, from HIPPOCRATES to CULLEN, PINEL, FRANK, HILDENBRAND, and KREYSSIG. The titles of many hundred volumes that have been written upon it might be adduced in proof of the consideration attached to it: and although much more has been imputed to critical evacuations, and days, particularly by the humoral pathologists, than legitimately belongs to them, and granting that too devoted an attention to them has induced many to adopt injudicious indications, and weak measures of cure, yet some reputation will be acquired from the prognosis which an acquaintance with them will enable the physician to give; and much benefit will result to the patient from the treatment which this knowledge will suggest.

2. Since the overturn of the humoral pathology, the doctrine of critical evacuations has undeservedly fallen into disrepute, although the eminent writers who contributed most to the overthrow are amongst its most rational and warm espousers. In our own country, at the present time, too little attention is paid to these evacuations, and still less to the periods at which they occur. There can be no doubt that the former is the most important; but the latter part of the subject should not be disregarded. After all that has been urged in favour of, or in opposition to, the doctrine, I may conclude that, in temperate climates, a number of diseases, particularly fevers, run on for certain periods with regularity, and, after an exasperation of the symptoms, or some violent perturbation of the economy, terminate by evacuations of different kinds, which tend to remove the train of morbid actions, and to restore the healthy functions. In other cases, the exasperation of disorder is followed by imperfect evacuations, occurring in an irregular manner; whilst in some it gives rise to

additional phenomena of a dangerous or fatal character: hence crises have been denominated *salutary* and complete, *imperfect* and *fatal*. It was considered by the older writers requisite to a salutary crisis, that the evacuations constituting it should be attended by favourable symptoms, and be copious and manifest; and not only appropriate to the disease, but also consistent with the state of the patient. An imperfect crisis was considered *better* or *worse*: the better state alleviating the malady; the worse rendering it more severe and dangerous, from the supervention of metastases and complications. Having described the phenomena which are critical, I shall next notice the periods of disease at which they are most frequently observed.

3. I. **CRISES** manifest themselves,—1st. **ON THE SKIN**: *A.* by sweats; *B.* by acute or chronic eruptions. 2d. **IN THE CELLULAR TISSUE**: *A.* by swellings in various parts; *A.* by boils and carbuncles; *C.* by gangrene; and *D.* by purulent collections. 3d. **IN THE GLANDS**: *B.* by buboes; *B.* by swelling of the parotids; *C.* by salivation; *D.* by a flux of urine. 4th. **ON THE MUCOUS SURFACES**: *A.* by increased excretion—*a.* from the nose; *b.* from the bronchi, &c.; *c.* from the stomach (vomiting); *d.* from the bowels (diarrhoea); *B.* by sanguineous exhalation—*a.* by flux—*a.* the hæmorrhoidal; *β.* the menstrual; *b.* by hæmorrhagy; *α.* from the nose (epistaxis); *β.* from the bronchi (hæmoptysis); *γ.* from the stomach (hæmatemesis); *δ.* from the intestines; *ε.* from the uterus (menorrhagia); *ζ.* from the urinary organs (hæmaturia).

4. 1st. *A.* **Sweats** are salutary crises in continued and bilious fevers, in inflammations of the lungs and liver, in bronchitis, and less frequently in rheumatism. FRACASTORI describes an epidemic putrid fever which generally terminated favourably in this manner. Acute dropsy, particularly anasarca, when caused by interrupted perspiration, sometimes disappears after copious sweats. This evacuation is usually preceded and indicated by a soft, full, open pulse; by a diminution of the alvine evacuations; by softness, and occasionally slight itching, of the skin; and by increased colour of the cheeks. A salutary sweat should be distinguished from such as are limited to the forehead or face, and the neck or breast, whilst the rest of the body is dry; or those which cover only the lower extremities: these constitute merely partial or incomplete crises, and merely diminish the violence of disease.

5. *B.* **Eruptions**.—Miliary and vesicular eruptions only are critical: the others are merely symptomatic, or even from a part of the disease; as erysipelas, purpura, petechiæ, &c. A miliary eruption is favourable, if the symptoms subside, if the patient feels an itching or pricking, if they be general, and do not appear before the seventh day: if they be unattended by fulness of the surface; and if their subsidence be followed by vomitings, hiccup, or convulsions, they indicate a fatal termination (LANDRÉ-BEAUVAIS). Sometimes a miliary eruption comes out at different periods, and prolongs the disease, when partial relief follows it, each appearance being an incomplete crisis. Many chronic eruptions may not only be complications of visceral disease, but occasionally imperfect crises,—they alleviating the internal malady. They are more rarely completely salutary.

6. 2d. *A.* **Swellings of various parts**, as of the face or neck, the hands, the lower extremities, &c., have been considered as partial crises in ataxic and gastric fevers, and in exanthematous diseases.—*B.* **Boils** are critical in some complaints, particularly towards the termination of acute diseases, especially small-pox.—*C.* **Gangrenous pustules** or **anthrax** occur in malignant or pestilential fevers; **gangrenous escars** also are met with in similar cases, as well as in typhoid or adynamic fevers; particularly about the sacrum, and in places which have been blistered, or pressed upon. If, in such cases, the febrile symptoms subside upon the sphacelation, and if the gangrenous change be rapidly and distinctly circumscribed, it may be favourably critical; but if the symptoms continue, and the pulse becomes more frequent, weak, small, and soft, the local mischief is entirely symptomatic, and indicative of an unfavourable termination.—*D.* **Purulent collections** are indicated by the continuance of the disease without any considerable evacuation, or exhaustion; by a sense of chill, horripilation or rigor, occurring at intervals, without any manifest cause; by the discharge of much clear urine; by partial sweats; by a softness of the pulse; by a remittent or hectic fever, and by flabbiness of the soft solids. The favourable changes of this nature occur in the extremities, and suppurate easily and rapidly. Those that are unfavourable take place in some internal viscus.

7. 3d. *A.* **Buboes** chiefly belong to pestilential fevers; but they are occasionally observed in the adynamic fevers of temperate climates. They indicate a favourable or fatal crisis in the manner stated with respect to gangrenous escars.—*B.* **Swellings of the parotids** occur in low or malignant fevers; and appear either alone, or with other critical changes. They are commonly preceded by a slight rigor; by severe headach, stupor, noises in the ears, and deafness, with paleness, swelling, and sometimes redness of the countenance. This occurrence is rarely critical, and, of itself, furnishes no sure indication of the issue: if accompanied with favourable changes, it becomes an additional sign of returning health; but if the swelling is slow, or disappears in a very short time, the other symptoms still continuing, it is a dangerous circumstance.—*C.* **Salivary** was noticed by SYDENHAM as a principal critical evacuation in the fevers of 1667 and 1668; and it occurred in the epidemic that prevailed at Breslaw in 1700. It occasionally supervenes in some forms of cynanche, and in bilious and gastric fevers.—*D.* **The urine** is sometimes discharged copiously at the height of febrile and inflammatory diseases; and is to be viewed as a favourable occurrence. It is usually clear when recently evacuated, but deposits soon afterwards a whitish or rose-coloured sediment. The symptoms indicating this discharge are very obscure. Some authors have noticed the "*pulsus myurus*," which consists of every three or four successive pulsations being progressively diminished. A sense of weight below the hypochondria; of gravative tension in the hypogastrium, and of heat in the urinary organs, is stated by M. LANDRÉ-BEAUVAIS to precede this evacuation.

8. 4th. *A. a.* **Coryza**, or sero-mucous excretion from the nose, is sometimes critical in continued fevers; but little importance is to be attached to

it.—*b. Mucous excretion* from the *bronchi* is frequently a partial crisis in several fevers, and in inflammations of the thoracic viscera (see *BRONCHI* and *LUNGS*).—*c. Vomitings* are rarely indications of a perfect crisis; they occasionally, however, favour the developement of those changes which precede a favourable termination of disease. They are sometimes ushered in by a bitter taste in the mouth, yellowish fur on the tongue, suborbital pain, and headach, nausea, salivation, coldness of the extremities; and frequency, and occasionally intermissions, of the pulse.—*d. Diarrhœa* and copious alvine evacuations are favourable crises in nearly all acute, and even in some chronic diseases. But it is necessary that they should be feculent or bilious, and homogeneous—not watery or flocculent: if they approach to a natural, or have a yellowish brown colour, and are followed by abatement of fever, &c., a favourable crisis may be confidently looked for. The chronic diseases, in which they indicate a change tending to health, are congestions and inflammations of the liver and spleen, hypochondriasis and melancholy, slight or incipient dropsies, rheumatism, and gout. They are usually preceded by borborygmi, with slight flatulent distension of the abdomen; flatulence and eructation; a sense of tension and uneasiness in the lumbar region; flying pains in the extremities; and a developed but unequal pulse, occasionally with irregular intermissions.

9. *B. Sanguineous exhalations* are often critical in the more inflammatory states of fever, and in the phlegmasiæ. According to HOFFMANN and LANDRÉ-BEAUVAIS, discharges of blood from the nose, the hæmorrhoidal vessels, or the uterus, are equally salutary in ardent fevers. In general, these hæmorrhages are preceded by depression of the morbid temperature, and erethism of the skin; by slight horripilations of the limbs; by a more open and rebounding pulse; and a sense of heat, pruritus, and tickling, in the part whence the evacuation is about to proceed.—*a. The menstrual flux* is sometimes a rapid crisis in fevers and phlegmasiæ. It is indicated by dull heavy pains in the loins, groins, and tops of the thighs; by tension in the hypogastrium; heat and pruritus of the genitals; pallor of the face, and a dark circle round the eyes; swelling of the breasts; pale, scanty urine; horripilation, and erithism of the skin; and by a quick, sharp, and unequal pulse. Very frequently the menses appear at the regular period, or a little earlier, or later, in fevers and inflammations, without affording any, or but imperfect relief. In these cases, they should not paralyse the activity of the treatment. When they occur at or before the usual time, are abundant, and are attended by evident benefit, they should be considered as critical: but if they are delayed, or are difficult or scanty, they are imperfect crises, and should not interfere with the measures which the circumstances of the case may require.—*b. The hæmorrhoidal flux* is often critical in inflammatory fever, pneumonia, hepatitis, and other phlegmasiæ. STAHL states that a return of this discharge is sometimes favourable in inflammations of the brain, and particularly in hepatitis, nephritis, melancholia, hypochondriasis, and mania. The observation is certainly correct. This evacuation is indicated by pains in the loins and the groins; by a sense of uneasiness and pressure towards the anus and perineum; by fre-

quent desire to pass the urine and go to stool; by flatulence and borborygmi, slight pallor of the face, and fulness of the hypochondria; and by fulness and inequality of the pulse as to strength.—*c. Critical epistaxis* was considered of great importance by the older physicians, who paid much attention to the symptoms indicating its accession: these are, redness, with slight tumefaction of the face and eyes; reddish or brilliant objects floating before the eyes; the involuntary shedding of tears; weight of the temples, and beating of their arteries; deafness, or noises in the ears; slight delirium, or vertigo; a sense of tension in the neck, with distension of its veins; a dull pain in the forehead, and at the root of the nose, or an itching and tickling in the nostrils; a quick, hard, full, and an unequal pulse; frequent and slightly laborious respiration; sometimes with tension or oppression, without pain, at the præcordia. Occasionally, pallor, and constriction of the whole surface, coldness of the lower extremities, and horripilations, also precede a critical epistaxis. This crisis is most common in young persons, and adults whose vital energies have been previously unimpaired, and who have been subject to this evacuation. It occurs most frequently in summer and autumn; in the more inflammatory states of fever; in the acute phlegmasiæ affecting the super-diaphragmatic organs; and rarely in hepatitis. If the discharge consists of a few drops only, it is an alarming symptom; and although it be copious, if not soon followed by amendment, it is unfavourable. When excessive, and attended by syncope, convulsions, loss of power, partial or cold sweats, and cold extremities, it is a fatal sign. A syncope, however, which terminates the epistaxis, is often followed by recovery (LANDRÉ-BEAUVAIS).

10. *d. Hæmoptysis, hæmutemesis, hæmaturia, and intestinal hæmorrhagy*, are always false or unfavourable crises. They are generally preceded by tension and tenderness of the hypochondria; and supervene most frequently in adynamic, malignant, and pestilential fevers; in confluent small-pox, scarletina maligna, and in scurvy: they occur less frequently in females than in males.

11. *A.* The above are the phenomena which have usually been considered critical by the older, and which are admitted by the best modern, medical writers; as well as the symptoms which indicate their accession. There are, however, still some circumstances connected with them deserving of notice.—*a. The hæmorrhagic evacuations* occur most frequently in the spring, or in dry summers, in persons from 15 to 35 years of age, of a sanguine or irritable temperament, and in acute complaints.—*b. The cutaneous evacuation* is most common in summer and autumn, in robust and fat persons upwards of 30 years of age, and in continued, remittent, and intermittent fevers.—*c. A critical diarrhœa* is most frequent in autumn, in persons of a bilious temperament, and in remittent and intermittent fevers.—*d. Discharges of urine* are observed in all ages, in all seasons, particularly winter and spring, and in all acute diseases.

12. *B. Critical evacuations* are—*a. rare*, in persons enfeebled by age, or by some other antecedent disease; in very moist and very cold, or very hot climates; during remarkably sudden and great vicissitudes of weather; and especially

when the vital energies are much reduced by a lowering and an evacuating treatment. — *b.* They are not always similar in the same diseases; and they vary in respect of the nature of the discharges, and of the periods at which they take place, as well as of the organs by which they are produced. A favourable change in gastric, bilious, and adynamic fevers, is often attended by alvine discharges of a homogeneous, fluid, yellowish, yellowish brown, or brownish black appearance, — in inflammatory fevers, in young men, by epistaxis, often occurring on the seventh day, — in these diseases, in young women, by a copious flow of the catamenia taking place on the same day, — and in men of middle age, by sweats, or by some other discharges coming on the fourteenth, or at a subsequent period. Catarrhal and bronchial complaints terminate with expectoration, or with sweats, or a copious flow of urine, &c.

13. *C.* The duration of critical evacuations is very uncertain. The hæmorrhagic, the alvine, and the urinary, seldom continue longer than twelve or twenty-four hours, sometimes even much less. Sweats and expectoration are occasionally of no longer duration; but, in the majority of instances, these two evacuations are prolonged several days before the disease is entirely subdued. Purulent collections and gangrene may take place in a few hours, but they generally require a much longer period.

14. *D.* Critical discharges cannot be changed or determined in their route or period of eruption, by art; and when they supervene, they cannot be safely interfered with, unless they threaten life by their excess. If they be interrupted by accident, or by an injudicious and meddling practice, they are followed by unfavourable metastases and complications, or sequelæ, sometimes terminating in organic change, and death. Thus, when the perspirations which occur upon the change in fevers, and some of the exanthemata, are interrupted, effusion often takes place from serous surfaces, or into the cellular tissue. The most active vascular depletions can never compensate for the suppression of an abundant menstrual or hæmorrhoidal flux, occurring at the acmé of acute diseases; — the effects of art are here unequal to those produced by nature. Hence the advantage of recognising critical evacuations, even although we may not otherwise confide in them. Although it is thus important to attend to them in our prognosis, and especially in the treatment, when signs of their accession appear, or when they are actually present, yet the expectation of their occurrence ought never to interfere with or prevent the adoption of judicious intentions and means of cure. Even granting, with HAHNEMANN, that they are not to be imitated by art, still they furnish several useful indications. "*Quo natura vergit, eo ducendum est,*" may occasionally be adopted, after a careful consideration of the changes of which they are the effects, but not the causes. Much mischief has accrued from considering critical evacuations as the causes, and not as the consequences, of changes that take place in the economy at the acmé of acute diseases. REIL has touched upon this fallacy, but has not considered the nature of the changes of which critical evacuations are the effects, or attempted to explain the manner of their accession.

15. II. CAUSES, &c. — *A.* We have seen that crises take place chiefly from eliminating or excretory surfaces and organs; and that they consist of a copious irruption of either previously suppressed secretions and excretions, or an accustomed sanguineous evacuation; but the causes which occasion, and the changes which precede them, are not so readily recognised. When we consider what they consist, especially in relation to the fact of their occurrence only in maladies characterised in their earlier stages by interrupted secretion and excretion, and by morbid excitement of the vascular system — the vascular excitement being perpetuated and variously modified by suspension of the visceral functions now mentioned, or by local irritation, or by both — we shall arrive at a tolerably accurate inference respecting the causes of crises, and the importance that ought to be attached to them. There are few facts in pathology better established than that vascular excitement, when it reaches a certain height, assumes an inflammatory form, impedes, interrupts, or even arrests, the natural functions of secreting or glandular organs; whilst a lower grade of excitement, unattended by inflammation, generally increases the functions of the organs thus affected. Therefore, when excitement continues to be expressed chiefly in the vascular system generally, secretion and excretion continue impeded or entirely suspended; and the effete materials, which, under other circumstances, are continually being removed from the circulation, accumulate in it, perpetuating and modifying the vascular excitement until it becomes exhausted, and until the accumulated noxious materials in the blood irritate the viscera destined to remove them, and thus incline the balance of excitement from the general vascular system to eliminating organs. Hence the occurrence of critical evacuations at the acmé of acute diseases; and hence their importance as indications of change in the states, — 1st, of vital power; 2d, of vascular action; 3d, of the circulating fluid; and, 4th, of the functions of secreting and excreting viscera. As crises have been neglected or confided in according as they agreed with the doctrines of the day, and have, in modern times, shared the fate of the pathology on which they had been so long grounded, I shall attempt to illustrate this view by a reference to one of the very common circumstances in which they are observed. A person exposed to the causes of autumnal fever of a bilious and remittent form, experiences during the earlier stages the usual symptoms of impeded or interrupted secretion and general vascular excitement, with evening exacerbations. In consequence of interrupted action of the emunctories, the blood contains an increasing proportion of effete materials, particularly of the elements out of which bile is formed. These for a while increase and modify the vascular excitement, and, when excessive in quantity, or especially noxious in quality, even tend to exhaust or depress it; but they, at the same time, being appropriate stimuli to the biliary and depuratory viscera, serve to restore their impeded functions, to turn the balance of excitement in favour of them, — thereby to reduce the morbid vascular action, to cleanse the circulating fluid from its impurities, and to change in other respects its condition; and thus the disease terminates with an apparent collapse,

form of the disease; 2d, *Nervous* or *Spasmodic* croup, or a slighter state of the inflammation, occurring in nervous and irritable temperaments, which influence the form and issue of the disease, giving rise to a spasmodic form of it; and 3d, *Inflammatory* croup, or that in which the inflammation of the air-passages is carried to a greater height, and is always attended by the production of a membranous exudation. The opinion that croup consists of an acute inflammation, occasioning the production, in a number of cases, of a false membrane; in others, of an albuminous concretion of various degrees of density; in some, of a viscid mucous secretion, and of the inflammatory lesions of the mucous membrane itself, already described (see BRONCHI, &c. § 3, 65.); has been attacked by MM. GUERSENT and BRETONNEAU, who consider that the formation of a false membrane is the distinctive character of croup; and that those cases in which it is not formed, are merely what they term *false* croup. I agree with M. BRICHETEAU in considering that the distinction here contended for is calculated more to puzzle the inexperienced, than to advance our knowledge. The experiments of SCHWILGUE, JURINE, ALBERS, SCHMIDT, and CHAUSSIER, as well as pathological observation, prove that the form of disease called false croup by the above authors proceeds from a similar state of morbid action as that denominated the pure disease, and is merely a modification resulting from less intensity of the inflammation, peculiarity of the temperament and habit of body, the causes occasioning it, and the greater predominance of the spasmodic or nervous states. The experiments of the authors now referred to demonstrate, that the injection of irritating matters into the air-passages sometimes produces simple inflammatory irritation; in others, a thick, viscid, mucous exudation; and in many, particularly in young animals, a complete false membrane. These differences of opinion, which are not confined to the writers now mentioned, but extend to many of those quoted in the course of the article, will appear, from what is about to be advanced, as more apparent than real. That the disease should present numerous modifications, approaching acute bronchitis on the one hand, and identical with laryngitis on the other, and varying characters according to the portion of the air-passages chiefly affected, the temperament, habit of body, severity of inflammatory action, and association with other diseases, is an inference to which *a priori* reasoning may lead every practitioner. Without adopting the confined views of some writers, or the hypothetical doctrines of others, I shall be guided chiefly by an extensive experience in the disease, and consider it under the following heads: — 1st, The symptoms and progress of true croup; 2d, The varieties or modifications of the disease most frequently observed; and 3d, The complicated and consecutive forms.

5. i. THE USUAL FORM AND PROGRESS OF TRUE CROUP. — The *simple* and usual form of croup generally commences with more or less of precursory symptoms, and runs its course in a few days. It has been divided by authors into different stages or periods, more, I believe, with the view of giving precision to their description, and to the treatment recommended, than from any

marked change in the character of the symptoms. M. GOELIS has divided it into four stages, viz. 1st, the invading or catarrhal stage; 2d, the inflammatory period; 3d, the stage of the albuminous exudation; and 4th, the period of imminent suffocation. A nearly similar division has also been adopted by Dr. CHRYNE. The difficulty of determining these various stages must be evident; and yet the advantages arising from a division of the disease into distinct periods must be evident, — not so much, however, for the purpose of description, as for the more strict appropriation of the means of cure. Premising, therefore, that croup, particularly this form of it, is strictly progressive, with no great change in its features, until towards its close; and that, therefore, all divisions of its course are merely arbitrary, and without any positive grounds in nature; I shall notice, 1st, its *precursory* signs; 2d, its *developed* and confirmed state; and 3d, the state of *collapse* and imminent suffocation.

6. A. The *precursory period*, *period of invasion* (GUERSENT), *of irritation* (ROYER-COLLARD), *catarrhal stage* (GOELIS), *febrile period* (DUROZ). These precursory signs are sometimes well marked, and of a distinctly catarrhal nature, as observed by GOELIS; occasionally they are slight, chiefly of a febrile description; and either from this circumstance, or from the shortness of their duration, attract but little notice. The febrile symptoms, when present, consist chiefly of alternating chilliness and heat, or, in the more acute cases, of slight chills, followed by heat of skin, frequency and hardness of pulse, slightly flushed countenance, want of appetite, headache, excited or variable spirits, alternation with sadness, lassitude, &c. Often, in place of these, or in addition to them, there are a short cough, hoarseness, sneezing, coryza, sometimes moroseness, and all the signs of common catarrh. Upon examining the pharynx and mouth, no trace of inflammation can be detected in this form of the disease; but the tongue is generally white, and loaded at its base. The eyes are watery, red; and the eyelids darker than usual. These symptoms are sometimes only of a few hours' duration, or they may be present for two or even three days. In very young children, they may be so slight as to escape detection, whilst a somewhat different train of phenomena, such as heat of skin, chilliness alternating with heat, frequent short fits of coughing during the night, want of sleep, restlessness, indications of uneasiness about the throat, furnished by the frequent application of the child's hand to this part, &c. manifest themselves. The importance of ascertaining the invasion of the disease have led several writers to pay much attention to its precursory symptoms. VIRSSZUX has attached much importance to the catarrhal signs, and change in the voice. But these are not by any means constant; and, even when present, may be merely the commencement of a slight catarrh; indeed, there is no symptom which can be relied upon, as indicating its approach, until the disease is nearly fully formed.

7. B. The *developed state of the disease*: *Inflammatory*, of CHRYNE and HOMAEUS. — After the above symptoms have existed for a longer or shorter time, or in a more or less marked manner, hoarseness, if it have not previously existed

nervous frames, but generally in a more spasmodic form. — *c.* Besides producing these, it may occasion, although very rarely, abscess in the vicinity of the larynx or trachea. I believe that dilatation of the bronchi is a much more frequent result. — *d.* Of the more indirect terminations and consequences of this disease, congestions of the encephalon, giving rise to *convulsions* and effusion of serum in the ventricles, or between the membranes, are the most important. In many cases, particularly in delicate and nervous children, the convulsive movements seem to commence with the spasmodic actions of the laryngeal muscles, and the strangulation thereby occasioned; the head and neck being thrown back, and all the limbs convulsed. Life is in some cases thus terminated by asphyxy. JURINE, VIEUSSEUX, and myself, have met with cases of *hydrocephalus* following the disease; but they are not common.

22. *C. Danger* is to be dreaded, when fever is very high early in the disease, and when respiration is permanently audible, cooing, and laborious, or as described above (§ 7.). When the disease goes on to the third stage, notwithstanding the treatment; when it presents any of the complications (§ 16.) and consecutive affections (§ 21.) already noticed; when the discharge of the characteristic exudation does not take place, or when the expectoration of fragments of it is not followed by any relief; when the countenance becomes livid or leaden, the eyes sunk, the lips and tongue dark, and the pulse very frequent, small, weak, and irregular; and the other symptoms of vital exhaustion appear; *great danger* exists. A *fatal issue* is to be expected when the patient presents the appearances described as characterising the third stage, particularly those noticed as marking its close (§ 8.).

23. III. DIAGNOSIS.—The hoarseness, and the loud, sonorous, and ringing cough; the forcible and difficult inspirations; flushed face; injected and watery eyes; the frequent and hard pulse, with thirst and inflammatory fever, the heaving of the thorax and motion of the trachea, in the developed stage; and the husky choking cough, the whispering voice, and wheezing respiration, &c. of the third stage; sufficiently distinguish this disease from any other. When it is uncomplicated, nothing beyond a slight redness is ever observed in the throat; and there is little or no pain upon deglutition, unless the larynx be much affected.

—*a.* Croup can scarcely ever be mistaken for *Cynanche maligna*, or *C. Pharyngea*, or any other form of sore throat, as long as these affections do not extend to the larynx; as the great difficulty of deglutition, and the but little disturbed state of respiration, independently of the obvious affection of the throat, &c., are sufficient to distinguish between them. When, however, portions of the concreted exudations in these affections irritate the glottis, they occasion a short, tickling, dry cough; and even excite, in some cases, strangulating spasms of the larynx, nearly resembling croup, particularly when it is complicated with these maladies. If, however, it be thus associated, the croupal characters, in addition to the appearances in the throat and pharynx, will be too evident to be misunderstood; the descriptions already given of these complications being sufficient to point them out. — *b.* During the eruptive fever of *measles*, the tracheal affection is often so great as

to simulate croup; and in many cases it even amounts, as already stated, to a slighter form of the complaint, which usually disappears as the eruption becomes matured; but attention to the symptoms will readily show the nature of the disorder, and how far the affection of the larynx and trachea should be viewed as a symptom, or as an important complication of the exanthematous disease. — *c.* Croup may readily be distinguished from *bronchitis*, by its sudden and severe attack; its occurrence in the evening and at night; its remissions; the hoarseness, and the ringing, dry, and frequent cough; the difficult inspirations, and impeded respiration; the altered voice and speech; the sensations and symptoms referrible to the trachea in the former, and to the sternum and chest in the latter; and by the absence of expectoration until late in the disease, when it is membranous or tubular, and not mucous and muco-puriform, as in *bronchitis*, until after the discharge of the membranous exudations. These characters will also serve to indicate the supervention of croup on *bronchitis*,—an occurrence which is sometimes observed, although much more rarely than that of *bronchitis* on croup. — *d.* *Laryngitis* is with greater difficulty distinguished from croup than the foregoing, and in many respects there is little or no difference. The practical importance of the diagnosis may not appear great, but it is sufficiently so to warrant an accurate distinction. 1st. True *laryngitis* occurs in adults; seldom, in children, in any other form than associated with either the simple or complicated states of croup. 2d. It is a purely inflammatory disease, attended by a fixed burning pain in the larynx, increased on pressure and examination; and, when attacking adults, never gives rise to a false membrane, unless it be superinduced in the specific and epidemic forms of *cynanche*, and then it assumes modified characters. 3d. It more frequently terminates in the manner characterising acute inflammations, viz. ulceration and suppuration, than when the larynx is affected in croup. 4th. It is more acutely and constantly inflammatory, the symptoms are more continued, and it is more benefited by a purely antiphlogistic treatment, than croup. 5th. It much oftener passes into the chronic form, than the latter disease. (See *LARYNX—Inflammations of.*) — *e.* *Chronic laryngeal and tracheal inflammation*—the laryngeal and tracheal consumption of some writers—resemble croup, in the hoarse voice, harsh dry cough, and the difficulty of respiration; but their progress is much slower, and less acute than croup; they do not present the violent paroxysms towards night; they seldom or never are observed in children; and ulceration of these parts of the air-passages is always found in fatal cases. — *f.* Croup may also be confounded with the diffusive inflammation which sometimes attacks, either primarily or consecutively, the cellular tissue about the throat, or with abscesses in the same situation; either of which may involve the larynx and membranous part of the trachea, or so affect them as to give rise to croupal symptoms; but the external appearances, the difficult deglutition, the state of the throat, and the history of the case, will at once show the differences existing between them. — *g.* *Pertussis* and croup can hardly be mistaken for each other; the invasion, charac-

ters, and progress of both diseases being so very different. The prolonged whoop, the unchanged voice, and the occurrence of the cough in convulsive paroxysms after a meal, terminating in vomiting and a copious discharge of a clear and glairy fluid; the complete intermissions, respiration, voice and speech remaining unaffected; the almost entire absence of fever, and the much more slight and chronic form of the latter disease in its uncomplicated state; are sufficient distinctions. Croup may, however, occur in the course of hooping cough; but then its characteristic symptoms will make it apparent to the attentive observer, and point out the nature of the resulting association. — *h.* The effects following substances that have escaped into the trachea often resemble croup; but may be distinguished from it by the sudden occurrence of pain and suffocation; by the frequent change of the exact seat of uneasiness with the change of the situation of the foreign body; the dryness of the cough, and the violence of the strangulation; and by the irregularity, the completeness, and sometimes the long continuance of the intermissions. When a foreign substance passes into the glottis, and is retained there, suffocation is generally occasioned either from the size of the substance, or from the spasmodic constriction of the muscles of the larynx occasioned by it. — *i.* *Hysteria* may also simulate croup; but the age of the patient, the history of the case, and the local and general symptoms, if attentively observed, will indicate the nature of the affection. — *k.* The spasmodic states of croup closely approach to *convulsive spasm of the larynx*; but the absence of cough and fever, the brief fits of strangulation, the complete intermissions, the spasm of the thumbs and toes, the purplish countenance, and the general convulsions, will distinguish that affection from any form of croup. (See LARYNX — *Convulsive Spasm of.*)

24. IV. CAUSES. — *A. a.* Croup is more frequent in cold and moist climates than in those which are warm. Rapid and frequent vicissitudes of season, weather, and temperature, have considerable influence in producing it. Hence its prevalence in the valleys of Switzerland and Savoy, in this country, particularly on its eastern side; in the other north-west countries of Europe; and in North America. But the middle, and even the south of Europe, are not exempt from it. M. VALENTIN has shown its frequency in the middle and southern provinces of France, GOELIS in Vienna, and GHISI in the north of Italy. Sir JAMES McGRIGOR notices its prevalence — probably in a complicated form, from its occurrence also in adults (§ 25.) — at Bombay, in 1800. According to the information given by JURINE, LENTIN, CHEYNE, and others, we might be led to infer that it has been more common in very modern times than formerly: the difference may, however, be owing to its having been mistaken for some other affection. I believe that it has not been so frequently met with during the preceding five years, as it was about twenty or thirty years ago. M. JURINE remarks, that, although the table he has given of the number of cases from 1760 to 1807, shows a nearly progressive increase, yet he has observed, at Geneva, no increase during the last eighteen years preceding the date of his work. The following evidence, nevertheless, would render it evident, that, in some countries at least, croup is more prevalent now than for-

merly. According to the information given by Dr. COOKSON, a practitioner of forty years' experience in Lancaster had never seen it until 1760. Dr. FRIEDLANDER (*Journ. de Montpellier*, No. IX. p. 276.), states, that it has become yearly more prevalent in Vienna; and that the physician to the Hospital for Children, who had treated, from 1774 to 1817, nearly 60,000 children, did not meet with a single case in the three first years of his practice, saw it but rarely during the next six years, and yet treated 1665 cases of it in the last five years of this period. Similar facts are also furnished by Dr. GOELIS. Although croup occurs at all seasons of the year, it is most prevalent in those which are cold and moist, or when the alternations of temperature are sudden and remarkable. I have observed it more frequently in the months of January, February, March, April, November, and December, especially if east or north-east winds prevail after heavy or continued falls of rain. I believe that the above results are nearly in accordance with those furnished by JURINE, CRAWFORD, MICHAËLIS, DOUBLE, and BRICHETEAU.

25. *b.* The great susceptibility of *early age*, and the narrowness of the larynx previously to puberty, have generally been supposed to favour the occurrence of croup. M. BLAUD, however, denies that this latter circumstance has any influence in causing it. This is doubtless the case in respect of the *production* of the disease, but not as regards its *severity* and *danger*, both of which it evidently increases. It is rare to meet with croup until after the child has been weaned: I have, however, seen it in children at the breast, as early as three, four, five, and six months of age; but much more frequently at this age in those who have been brought up by hand; and in a still greater number of instances, at from seven months to upwards of a twelvemonth, in those which have been recently weaned. M. DUROS states, that he met with an instance of it in an infant of a few days old. The age at which the disease is most common is, according to my experience, from one year to nine. But it not infrequently occurs at both an earlier and a later period. VAN BERGEN states, that it is often observed from the age of two to five years inclusive: HOME assigns from fifteen months to twelve years: CRAWFORD mentions some cases from fifteen months to two years, but gives the age of from two to eight as the most common: CHEYNE, from sixteen months to twelve years; SALOMON, from two to five years inclusive; MICHAËLIS, from fifteen months to ten years; ZOBEL, from the latter months of suckling to nine years; VIEUSSEUX, from seven months to ten years: BERNARD, from one to six years; BARTHEZ, from two to ten; RUMSEY, till fourteen; and CAILLAU, from eighteen months to eleven years. The foregoing applies only to the simple and uncomplicated disease. When it occurs in a complicated form, or consecutively upon anginous affections, particularly upon inflammation of the pharynx, tonsils, or fauces, or on the exanthematous diseases, it may, and, indeed, occasionally does, occur in adult subjects, and in infants of a more tender age. The cases published by M. LOUIS, and denominated by him croup in the *adult*, were instances of the anginous complication. Although the occurrence of uncomplicated croup in adults is very

39. There is one important point not sufficiently adverted to by authors, viz. the very early period at which the tracheal exudation is often poured out, in the inflammatory states of the disease; the symptoms marking the first or premonitory period being those indicating the local development of the malady. Thus, a healthy child has evinced no disorder for several days, or the disorder has been so slight as to escape observation — it may even be more than usually lively and alert on the day preceding the night on which it is most severely attacked; and yet, if an emetic be that instant exhibited, a large quantity of thick, glairy, sanguineous, and gelatinous matter will be brought away from the air-passages; showing that, in many instances, the early advances of the inflammatory action is slow and insidious; that the characteristic seizure often does not occur until the exudation has accumulated to a considerable extent in the trachea, or the inflammation has extended to the larynx; and that it is partly owing to the retention of this matter, — which is evidently thrown out in a fluid form, — that it concretes into a false membrane, each successive discharge sometimes forming a distinct layer. MM. GENDRIN, ANDRAL, and other pathologists, have remarked, that the inflammatory action which gives rise to the albuminous exudation on the surface of mucous membranes is of a sub-acute, rather than of an acute kind. I believe that this is the case in respect of the inflammation of the trachea and larynx, in croup; and that the formation of a false membrane is the result not so much of the sthenic or acute character of the local action, as of the abundance of albumen and fibrine in the blood, — a circumstance which partly accounts for the frequency of relapses in some children (§ 41. c.), and justifies HALLER, HECKER, and others, in considering the disease to consist of a peculiar form of inflammation. Some writers, however, suppose that the very acute symptoms, and rapid termination of many cases, militate against these opinions; but it should be recollected that, even in the most severe cases, the inflammatory action, when it commences in the trachea, often exists for several days, in the manner already noticed, until it has either extended to the larynx, or produced such a quantity of albuminous exudation as will obstruct respiration, or induce, by its irritation, spasm of the air-passages, — these effects being the chief causes of the severity and rapid termination of the disease. This will become more evident, when we consider the consequences of interrupted respiration upon the frame — whether the interruption proceed from the mechanical obstruction occasioned by the exudation and false membrane, or the frequent recurrence or continuance of spasm of the larynx and trachea; or from inflammatory action, and its consecutive exudation extending down the bronchi; or from two or all of these combined. These consequences are, in fact, the third stage of the disease; the symptoms of which are the usual phenomena resulting from obstructed respiration, interrupted circulation, and congestion of the lungs; imperfect action of the air upon the blood, and the circulation of this fluid in a nearly venous state, with congestion of the cavities of the heart, and impeded return of blood from the head. The circulation, moreover, of imperfectly arterialized blood to the nervous systems occasions lethargy, with sinking of the vital powers, and increases the disposition

to spasmodic action of involuntary parts, and to convulsive movements of voluntary organs; all which (the former especially) become so prominent a character of the malady in its advanced stages, and often terminate existence. Thus it will appear manifest, — and the fact is of great practical importance, — that the severity, rapidity, and danger of croup, are not the immediate consequences of the activity or acuteness of the inflammatory action; but of the exudation to which it gives rise, and of the conformation and functions of the parts which it affects.

40. DUVAL, JURINE, ALBERS, and SCHMIDT, have considered it worth ascertaining, in how far the disease could be *artificially produced* in the lower animals; and whether or not, when thus produced, inflammation exists to the extent of accounting for the phenomena, or gives rise to a false membrane. They injected into the trachea of fowls, dogs, cats, sheep, wolves, &c., various irritating substances, as the bichloride or peroxide of mercury (SCHMIDT) dissolved in spirits of turpentine, and solutions of iodine, and nitrate of silver; they moreover made these animals inhale the fumes of sulphuric and hydrochloric acids; and the results were just what might have been anticipated, viz. that in some cases, inflammation without any exudation was produced; in others, a fluid, or more or less concrete exudation was found in various quantity; and in all, the matter in the air-passages was not sufficient entirely to obstruct the access of air to the lungs; thus confirming the opinion justly contended for by CULLEN and others, that a great part of the phenomena and consequences of the disease is to be attributed to spasm of the larynx and trachea. SCHMIDT succeeded in producing a false membrane only in young animals, — a fact in accordance with the spontaneous occurrence of the disease previously to puberty, and to be referred to the more albuminous state of the blood often observed at this period. It may be of importance to know that croup — identical in its phenomena and organic changes with the disease in the human subject — occurs also in several of the lower animals, especially before they are fully grown. Its occurrence in chickens is well known by the name of "*Pip*." DUPUY, RUSH, VALENTIN, YOVATT, and others, have observed it in horses and dogs; DOUBLE, in lambs and cats; and GHISI and GOHIER, in cows. In some of these animals it has even occurred as an epidemic.

41. *Pathological Conclusions.* — Another point, of greater importance than it may at first seem, is whether or not the matter concreted and moulded on the inflamed mucous surface be exuded by this tissue itself, or secreted by the follicular glands with which it is so abundantly supplied. M. GRIMAUD has adopted the latter alternative. From particular attention I have paid to this subject, some of the results of which have been stated in the article BRONCHI (§ 11, 12.), I would draw the following inferences relative to it, and to the pathology of croup generally: — (a) That the mucous membrane itself is the seat of the inflammation of croup; and that its vessels exude the albuminous or characteristic discharge, which, from its plasticity and the effects of temperature and the continued passage of air over it, becomes concreted into a false membrane; — (b) That the occasional appearance of blood-vessels in it arises from the presence of red globules in the fluid when first exuded from the inflamed vessels, as may be

43. *A. Treatment of the common and inflammatory Croup.*—*a.* If the practitioner see the patient in the *first stage* (§ 6.), particularly if hoarseness, or a rough cough, with other catarrhal symptoms, be present, it will be proper to give an active antimonial emetic, with the view of fulfilling the *first* of the above intentions. This will often bring away a considerable quantity of a thick, glairy, and sometimes slightly sanguineous matter from the trachea, and will give immediate, although generally only temporary, relief. If the matter discharged from the air-passages present the above appearances; if the child be plethoric, the pulse at all excited, and the countenance flushed; we should not be deceived by the calm following the full operation of the emetic, but should have recourse to blood-letting. In the majority of instances, cupping between the shoulders or on the nape of the neck, or the application of leeches on the sternum, to an extent which the age, habit of body, and strength of the patient may warrant, will be preferable to venesection. Under these circumstances, particularly when the nausea occasioned by the emetic has hardly subsided, the abstraction of little more than an ounce, or an ounce and a half, of blood, for every year that the child may have completed, will be borne. In town practice, the local is preferable to general blood-letting; but the latter will be adopted, with advantage in the country, amongst plethoric and robust children. The advantages of depletion and antimonials are attributable to their influence in arresting the inflammatory action, and, from the consecutively accelerated absorption of fluids into the circulation, to the relative diminution of the albuminous constituents of the blood. I have in several cases directed, after a moderate depletion, and after the operation of an emetic, a piece of folded flannel to be wrung out of hot water, and freely sprinkled with oil of turpentine, or with either of the liniments (F 296.311.), and applied around the neck and throat. This application has given instant relief.

44. Immediately after depletion, and an emetic, the best internal medicine undoubtedly is *calomel* and *James's Powder* — from three to five grains of the former, and two or three of the latter being given. This powder may be repeated every second, third, or fourth hour, until two or three doses have been taken. After the first dose, the child should be put in a tepid bath; and be allowed as much tepid diluents as the stomach will bear, in which carbonate of soda may be dissolved, and which may be rendered agreeable with syrup. If the powders, given to the extent now mentioned, have not acted upon the bowels, castor oil, or some other purgative, assisted by an emetic, should be administered. These means, aided by the turpentine epithem applied around the neck, will seldom fail of cutting short the disease. If, however, it still proceed, the means to be employed in the next stage should be adopted according to the circumstance of the case.

45. *b.* The *second or developed stage* is that in which medical aid is most frequently resorted to; and at this period, conformably with what has been stated (§ 39.), the disease is actually further advanced than the symptoms indicate. At its commencement, however, the *first intention* of cure should be attempted; but the most decided means will be now requisite to attain its fulfilment. These should be put in practice, even although the treatment already recommended

may have been employed in the preceding stage. An active antimonial emetic should be instantly exhibited, so as to produce full vomiting; and immediately upon the conclusion of its operation, *blood-letting*, general or local, must be resorted to. The abstraction of a greater quantity than that indicated above (§ 43.) will seldom be more beneficial, nor, indeed, will it be borne without producing syncope, which, in children, especially, should be avoided, as favouring the supervention of convulsions or reaction. But it may be requisite, particularly when the patient has not lost any blood during the preceding stage, to repeat the depletion. On this, or on any future occasion of repeating it, local blood-letting, in the situations and mode already mentioned (§ 43.), is now to be preferred. If they have not been prescribed previously, the calomel and James's powder should be given every two or three hours, until three or four doses are taken; and the adjuvants directed to accompany and to follow this medicine in the first stage, should also be employed in this.

46. Having thus carried depletion as far as seems prudent, and fully evacuated the *prima via*, if a very obvious improvement have not taken place, or if the suffocating seizures recur notwithstanding, *dry cupping* may be resorted to, and afterwards either a blister should be applied between the shoulders, on the nape of the neck, or on the epigastrium, *but never on the throat*, or the turpentine epithem (§ 43.) ought to be applied around the neck. If symptoms of febrile excitement still attend the seizures, an emetic should be given, so as to excite vomiting again, and be repeated until it has this effect fully. If the urgent symptoms and fever still continue, vomiting may be excited a third or fourth time at intervals of two or three hours. The tartar emetic is, upon the whole, the best medicine for the purpose in the early or inflammatory states of the disease, and may be given in doses of half a grain, in simple solution, to a child two or three years old, as advised by Dr. CHEYNE, and repeated at about half an hour, or sooner, if vomiting be not induced. M. GUERSENT prefers ipecacuanha, and advises blood-letting to precede the exhibition of emetics. Where the inflammatory action is considerable, this method may be adopted; but where we may expect to bring away the exuded matter by means of an emetic, before it has concreted into a membrane, it will be as well to exhibit one without delay, and to keep up a constant nausea by the same medicines given in frequent and small doses. But I have seen the tartar emetic not only fail in producing vomiting, but also prove injurious by causing dangerous vital depression.

47. If the symptoms continue notwithstanding the judicious use of the above means, we should infer the formation of a false membrane, unless the exacerbation be altogether spasmodic — the breathing and voice becoming natural, or nearly so, in the intervals. The measures to be employed now should have reference to the separation and discharge of the concrete exudation, and the removal of spasmodic symptoms — to the fulfilment of the *second* and *third intentions* proposed. Bleeding, even if the state of the patient would admit of it, would not promote these intentions; and the exhibition of calomel or mercurials, excepting with the view of promoting all the abdominal secretions and excretions, and thereby to derive from the diseased organ, would not

materially assist our views, inasmuch as it is impossible thereby to affect the system of children so as to prevent the formation of coagulable lymph. In this case, we should assist the operations of nature in detaching the false membrane. It has been stated, that this is accomplished by the effusion, by the excited follicles, of a fluid matter between the concrete substance and the mucous coat; therefore those medicines which have usually the effect of increasing and rendering more fluid the mucous secretion of the air-passages, should now be prescribed. But care should be taken not to exhibit these or any other *expectorants*, too early, or until depletion has been carried sufficiently far. They are most serviceable about the termination of the second, and the commencement of the third stage. The medicines best calculated to act as expectorants in this disease are, the preparations of *squills*, of *ammoniacum*, of *senega*, the *carbonates*, and the *sulphurets* of the *alkalies*, and *camphor*. The oxymel or syrup of *squills* may be given, either alone, or with some one of the sulphurets, or with *senega*, and generally to the extent of keeping up a slight nausea, unless the exacerbations of cough and suffocation be severe, when full vomiting should be produced by their means. I prefer the emetic effect at this period to be obtained by *squills*; as antimony lowers too quickly the vital power, which ought now to be supported, so as to enable the diseased organ to throw off the morbid matter formed upon its surface. A mixture, consisting of decoction of *senega*, with *vinum ipecacuanhæ* and oxymel of *squills*, may also be adopted with equal advantage. When the medicines fail of exciting vomiting, the pharynx should be irritated by a feather. I have seen very much benefit derived from this simple means; and have considered it more beneficial than any other, in the third stage, in promoting the discharge of matters from the trachea. *JURINE* also places great reliance on it. When severe exacerbations, with spasm and threatened suffocation, occur, it is always most advantageous to produce instant vomiting. The sulphate of zinc has been advised by *M. GUENSENT*, and the sulphate of copper by *Dr. HOFFMANN*, for this purpose. In this state of the disease, I have applied the warm *turpentine epithem* mentioned above (§ 43.), around the neck, with almost instant benefit.

48. During this and the preceding stages, the inhalation of watery and medicated vapours may be resorted to. At the commencement of the disease, vapours of an emollient kind are most beneficial; but when we wish to promote expectoration, camphor may be added to the substance used in this way. *HOME*, *CRAWFORD*, *PEARSON*, *ROSEN*, *PINEL*, and *GOELIS*, have approved of this practice. When spasmodic symptoms manifest themselves, inhalation, assisted by the tepid or warm bath, is often of use; but antispasmodics should also be prescribed with the other medicines, or in enemata. I have never seen any permanent advantage derived from narcotics given by the mouth, except from *opium* or syrup of poppies, combined with antispasmodics; probably owing to their lowering the vital energies, which are always much depressed when nervous symptoms appear. Great care should be always taken in exhibiting *opiates* in clysters to children: in very young children the practice is attended by much risk. *Opiates* are given to greatest advantage with *ipecacuanha*, as in

DOVER'S powder, or with camphor, or calomel, or with both. I have likewise found camphor, with *James's* powder, and *hyoscyamus*, of much benefit in some cases in which I have prescribed it. The *hydrosulphuret of ammonia* may likewise be tried in both this and the next stage of the disease.

49. In many cases, the judicious use of blood-letting, calomel, antimony, &c. will cut short the disease, even although the patient may not have been treated until this period has been far advanced; and in others, the active use of these means may give rise to very alarming depression of the vital energies, even when they may have succeeded in removing the cause of obstruction and irritation in the air-passages. In these, stimulants, antispasmodics, and restoratives must be immediately resorted to, but with great caution, lest the inflammatory action may be reproduced by their means.*

* The following case will illustrate the above observation, and may prove instructive to the less experienced reader. I have extracted it *verbatim* from my note-book, with the remarks suggested at the time appended to it:—

William Hodson, aged five years and a half, was seized on the 17th of Nov. 1821, with hoarseness, fever, and a ringing, dry cough. The mother opened its bowels with salts, and gave it some antimonial wine. The following day, in the evening (18th), I saw it. There was much fever, with flushed countenance, and a constant, hard and ringing cough, with a sibilous noise on respiration. Pulse frequent and hard; skin harsh and dry; great restlessness, tossing, dyspnoea, with hoarseness, and the characteristic breathing of croup. I directed blood-letting from a vein in the arm; and the blood was allowed to flow in a full stream till approaching syncope was indicated, seven ounces being abstracted; and the following powders were directed to be taken every ten minutes, till full vomiting was induced; and subsequently every three hours:—

No. 162. R. Hydrag. Submur. gr. xxx.; Antimon. Pot.-Tart. gr. iij.; Pulv. Ipecacuanhæ gr. vj. M. benè, et divide in Pulv. viij.

Early in the morning of the 19th I again saw the child. The powders had been given, as above, until full vomiting had been produced; and one powder had been taken subsequently. The sense of suffocation had disappeared after the vomiting. The matters ejected contained muchropy mucus, with membranous shreds of firm coagulated lymph floating in it. The cough and croupy symptoms had disappeared; the voice was clear, and the respiration easy; but now the child complained of distressing weakness, with frequent vomiting and purging: the stools were first bilious, offensive, copious, and faculent; but they had now become watery. The pulse was extremely frequent, so as scarcely to be counted; and so small and thready as hardly to be felt at the wrist. The countenance was pale and sunk; the skin cool and moist; and all the symptoms of sinking of the powers of life, very manifest. The powders were discontinued, and the following mixture directed:—

No. 163. R. Aq. Cinnam. 3 iijss.; Spirit. Ammon. Arom. 3 jss.; Tinct. Opil Mxxv.; Syrupi Scillæ 3 iij. M.

Two teaspoonsful of this were to be taken every ten or fifteen minutes, until a decided effect from it was evinced. After four or five doses, the stools and sickness were restrained, and the child fell into an easy and sound sleep.

A blister was now applied to the sternum, which was to be removed at the end of four hours, and poulticed with a bread-and-water poultice. The *semicupium* was to be employed afterwards, and at bed-time. Three grains of calomel, with one of *James's* powder, to be taken at night, and the mist. camphoræ, with liq. ammon. ac. et vinum ipecacuanhæ, and syrupus papaveris, every three hours. Linseed tea or barley water, with sugar-candy or liquorice for common drink.

20th.—All the symptoms of croup had disappeared, but there was still some cough and fever, with occasional paroxysms of difficult breathing. The bowels had been open this morning; pulse 120, and small. Antimonial wine was added to the mixture; and an injection directed, with asafetida, spiritus terebinthinæ, oleum ricini, and camphor.

In the evening.—He had had no return of the paroxysms since the injection, which was retained above an hour and had procured two evacuations. Pulse 116; cough less frequent; skin more natural. The blistered surface had risen in some parts, and was inflamed in all.

From this time he continued to recover: diaphoretics, demulcents, aperients, and the *semicupium*, being employed until convalescence was complete.

Remarks.—It is by no means unusual to find a recurrence of the inflammatory and local symptoms after they have been apparently most completely subdued by means similar

ment must be directed according to the same principles. In all cases of angina, attended with membranous exudation, whether the attendant constitutional disturbance present sthenic or asthenic characters, the local treatment advised by Mr. MACKENZIE should be adopted upon the appearance of the exudation on the tonsils or fauces, and a large blister should be applied early, as being the most efficacious means of preventing the extension of this form of inflammation to the pharynx, air-passages, or œsophagus.

57. c. The treatment of the complications with *aphthæ*, or with any of the eruptive fevers, will depend, as much as the foregoing, upon the state of vital power characterising the constitutional affection. The appearance of croupal symptoms in the course of small-pox — particularly confluent small-pox — will require nearly the same medicines as have now been recommended (§ 56.); and the washes advised to be applied to the mouth and throat will be equally serviceable in the *aphthous*, as in the *variolous* complication. When croup is consequent upon either *measles*, or *hooping cough*, vascular depletion is more frequently required than in almost any other complication, excepting that with inflammation of the throat of a sthenic kind, whether attended by albuminous exudation or not.

58. D. The affections consequent upon croup — or the states of disease which it excites, or into which it passes — acquire not only appropriate remedies, but also the application of them with strict reference to the primary malady, and the means by which it was combated. When it runs on to *bronchitis*, the latter affection commonly assumes the asthenic form, generally terminates fatally, and requires the treatment described in the art. BRONCHITIS (§ 70. et seq.). Its passage into *pneumonia* is attended with similar results; and depletions, unless they have been previously neglected, are not well borne. When *diarrhœa* or *dysenteric* symptoms are produced, in the latter stages, by the means used to remove the disease, we shall generally find the preparations of *opium*, and the warm bath, as hereafter to be noticed, of much benefit. A considerable number of cases, particularly those complicated with sore throat, terminate in *sinking* or *exhaustion* of vital power, and not by suffocation. This circumstance should be kept in view in the treatment of the last stage; and its earliest indications be met with suitable stimulants and tonics (§ 56.). In cases presenting *imminent suffocation*, the question of *tracheotomy* should be entertained; but at the same time, with the recollection, that either exhausted vital power, the extension of disease to the bronchi, and the accumulation of viscid or concrete exudations in them, or inflammatory action, or emphysema of the lungs themselves, may tend, individually or in combination, to prevent the success of the operation, independently of the immediate contingencies to which it is liable. (See § 74.) *

* I may here adduce a summary of the practice adopted by the most experienced physician in France in this disease — the senior physician to the Hospital for Children in Paris. It will be seen how closely it agrees with my own, in a similar institution in London: —

M. JADELOT considers croup as a kind of angina of the air-passages; presenting more violent symptoms, and having true paroxysms, separated by well-marked intermissions of a special character. He admits different degrees of the disease, without changing its nature. Bleeding by leeches, and emetics, are the agents he most

59. REMARKS ON VARIOUS REMEDIES ADVISED, AND ON THE OPINIONS OF AUTHORS RESPECTING THEM. — a. *Nauseants* and *emetics*. In the first stage of the disease, and in the commencement of the second, I have sometimes found that *tartar emetic*, given so as to produce and prolong a state of *nausea*, has so completely relieved the croupal symptoms as to prevent altogether the necessity of having recourse to blood-letting: and that in other and more severe cases, the same medicine, exhibited so as to produce vomiting, and to continue the nauseating effect for some time afterwards, and thereby to prevent reaction supervening upon the emetic operation, has been followed by a similar result. *Emetics* have been much recommended after blood-letting, and the inhalation of vapour, and when the exudation is presumed to begin to loosen, by HOME, LENTIN, DARWIN, MAERCKER, PORTAL, SMITH, HECKER, VIEUSSEUX, RUMSEY, &c. When the patient has not been visited sufficiently early, this plan is certainly judicious. But when he is seen in the first stage, it will be better to attempt to prevent the formation of the false membrane, by exhibiting *nauseants* or *emetics* instantly, as now advised, and, unless the inflammatory symptoms are very severe, before having recourse to blood-letting. This early exhibition of emetics is sanctioned by CRAWFORD, CHEYNE, PINEL, HOSACK, THOMPSON, HUFELAND, ALBERS, SCHWILQUE, &c. Dr. GAIBLER prescribes, on the invasion of the disease, tartarised antimony and oxymel of colchicum. Whilst vascular excitement continues, either this combination, or the antimony only, in repeated doses, as suggested by CHEYNE and MICHAËLIS, is the best emetic; but when we wish to detach the membranous exudation, the preparations of squills, alone, or with ipecacuanha, are preferable. In the more spasmodic form of the disease, ipecacuanha, as GOELIS remarks, is as suitable an emetic as can be adopted: but when it is found necessary to exhibit such a medicine in the last stage of the disease, or when it is associated with angina maligna, or attended by symptoms of depressed vital power, senega, squills, or the sulphate of zinc, given with stimulants and antispasmodics, or F. 402., or the sulphate of copper (*Encyclog. t. xxii. E. p. 10.*), are to be preferred. GOELIS recommends emetics in the first stage of the least inflammatory forms, and generally in the third

frequently employs in its treatment. Emetics alone have often sufficed to stop the disease, especially in weak, pale, or bloated subjects; but, in opposite cases, he insists on the application of leeches, and allows the blood to flow until the child becomes pale, and the pulse loses its strength. After the bleeding, he causes vomiting, several times in succession, at intervals of two or three hours; and the practice is attended by the greatest success, relief being very apparent after each vomit.

When the croup has arrived at the second period, without having been opposed, and the presence of a false membrane is suspected, M. J. directs leeches to be applied; but, the moment they fall off, he hastens to produce vomiting: and it is in this case that he employs, by spoonful, every ten minutes or quarter of an hour, the mixture called anticroupal*, until full vomiting is produced. He insists, also, upon the use of errhines, and of derivatives applied to the skin and intestinal canal.

When the disease is very rapid, it has been a question whether or not we should commence by bleeding, or by an emetic. M. J.'s opinion is, that we should first bleed, if the child be robust, and if it present signs of congestion towards the superior parts; on the contrary, he would commence by vomiting, when the subject is pale and exhausted, and there is little heat or fever. (RATIER'S *Medical Guide*, &c.)

* R. Infusi Polygalæ Senegæ 3iv.; Syrupi Ipecacuanhæ 3j.; Oxymel. Scillæ 3ij.; Antimon. Potassio-Tart. gr. jss. Misce.

throat, as recommended by some writers; and, in very young and delicate children, it will be better not to place them over leech-bites. In the latter periods, I prefer to blisters the use of warm poultices, on the surfaces of which Cayenne pepper and scraped camphor are sprinkled in quantity sufficient to produce redness of the cuticle; or the application of warm cloths, moistened with either of the *liniments*, F. 300. 307, 308. These are particularly useful upon the removal of the patient from a warm bath, especially in the complications of the disease. The *turpentine epithem* already advised applied around the neck has proved, in my practice, more successful than any other remedy, constitutional or local. It may be employed at any period of the disease, and is highly beneficial in all its forms. *Sinapisms* have been directed by many to be applied to the extremities; but I have seen more harm than benefit produced by them, from the distress and crying they occasioned.

63. *Internal and external emollients* are sometimes useful auxiliaries, particularly in the first stage. The decoction althææ, the mist. amygdal. dulcis, the inspissated juice of the sambucus niger, mucilages, with liquor ammoniæ acetatis, vinum ipecacuanhæ, and syrup (see F. 47. 389.), may be used internally; whilst warm fomentations, with decoction of chamomile flowers and poppy-heads, are applied about the throat, and frequently renewed, upon the occurrence of hoarseness, cough, and difficult respiration. These have the effect of retarding the approach of the latter and more dangerous states of the malady, even when they fail of rendering more efficient aid. LENTIN advises camphor to be applied to the chest; but it will be more beneficial to employ it along with the fomentations, which may extend over both the throat and the upper part of the chest; or it may be placed upon warm poultices, as advised above, particularly in the more spasmodic and complicated states of the disease.

64. *Cold epithems* on the throat have been employed by some writers, and particularly by FIELD. They appear to have been of little service in his cases. I am unable to give any opinion respecting them from my own experience. They seem not to be equal to warm fomentations. GOELIS states, that they are dangerous means to resort to; and alludes to cases where they were injurious.

65. *Semicupium and pediluvium* are useful modes of derivation, in the first and second stages especially. But salt, mustard, and, in some cases, a little of either of the fixed alkalies, or of the sulphurets, should be added to the water, and its temperature gradually increased as immersion is prolonged. Great care is requisite in removing the patient from the bath, to prevent any chill. In many cases, it will be preferable to wring as dry as possible large pieces of flannel out of warm water prepared as above, and to wrap them round the lower limbs of the patient, changing them frequently, or prolonging the use of them, according to circumstances, and preserving the bed-clothes from moisture.

66. *Tepid and warm bathing* are of service — the former in the early stages, the latter in the advanced periods, of the disease. GOELIS advises the tepid bath of about 23° or 24° of Reaum.; and to be rendered antispasmodic by using a decoction of chamomile flowers and poppy-heads;

or irritant, by adding some caustic alkali; or both antispasmodic and derivative, by a combination of these substances, according to the circumstances of the case. I have, in a few instances, used these baths, upon the recommendation of this writer, and certainly with marked advantage, but I have increased their temperature in the latter stages of the disease, rendering them, at the same time, more irritating by the addition of an alkali. In the early periods, however, the emollient and antispasmodic form of bath seems preferable, particularly when the patient breathes the vapour rising from it. The *duration* of immersion should seldom be shorter than twenty minutes, unless circumstances should prevent it; and I am convinced that it may be prolonged to two hours with advantage, in some instances. In a case despaired of, I caused, upon the recommendation of GOELIS, the child to be put in a bath consisting of a decoction of chamomile flowers and poppies, to which some caustic alkali was added. It was kept there for twenty-five, and on a second occasion forty, minutes. It ultimately recovered. Care must be taken that the temperature of the bath does not fall during its continuance. As soon as the patient is removed, and the skin dried, he should be placed in warm flannel, or in a blanket; and perspiration encouraged by diaphoretics suited to the nature of the case and stage of the disease; in the early stage by antimony or ipecacuanha, so as to excite slight nausea, or occasionally vomiting, if requisite; in the latter periods, with liquor ammoniæ acetatis, given in sufficient quantity to produce the same effects, or, if sinking be apprehended, with camphor, ammonia, &c.

67. *Purgatives* have been given with different intentions; — either as mere evacuants of retained secretions and excretions; or as active derivatives from the seat of disease. HOME, DESSEZARTZ, and MICHAËLIS, seem to have resorted to them with the former intention; HAMILTON, PINEL, and AUTENREITH, with the latter view; CRAWFORD, THOMPSON, and others, prescribing also enemata. My own experience is decidedly in favour of this class of medicines; and of employing calomel, jalap, scammony, &c., and extract of colocynth, with assafoetida, &c. in enemata (§ 51, 52.).

68. *Sudorifics* are of use only in the early periods of croup. James's powder, and the other preparations of antimony, subsequently ipecacuanha, and liquor ammoniæ acetatis, or the one combined with the other, and given to the extent of exciting nausea, in conjunction with emollients (§ 63.), are important auxiliaries. GOELIS remarks, that DOVER's powder is seldom productive of any benefit; and that sudorifics are never of service in the last stages. Gentle *diaphoresis*, early in the disease, is undoubtedly beneficial, when the patient drinks freely of emollients; but he with justice adds, that very copious sweats only increase the disposition to form false membranes of a firm and adherent kind, owing to the evacuation of too large a proportion of the watery parts of the blood. In these opinions, TREBER, HIRSCHFELD, and most of the Vienna physicians, agree.

69. *Expectorants*. — Under this head may be ranked an important part of the remedies prescribed in croup. The *inhalation* of vapours has already been noticed. The experienced GOELIS places much confidence in them during the first and third stages; in the latter of which they often increase the cough, but they favour the discharge

of false membranes, by increasing the mucous secretion by aid of which they are thrown off. I have mentioned (§ 47.) the expectorants in which my experience has led me to confide. There are very few which have been more generally recommended than *senega*. ARCHER, BARKER, VALENTIN, ROYER-COLLARD, LENTIN, MAERCKER, CARRON, &c. recommend it after bleeding. Dr. ARCHER, who attributes the greatest virtues to this medicine, advises it to be given at the same time as calomel, in frequent doses, until it excites vomiting or purging. GOELIS and TREBER remark, that, although a good remedy in the third stage, it is by no means possessed of those specific virtues attributed to it by Dr. ARCHER; and in this I agree with them. It is a useful medicine in the complications of the disease with malignant sore-throat or scarlatina. *Squills* are chiefly trusted to by HUFELAND, RUMSEY, and MAERCKER, in the latter periods. They should not be exhibited in the more inflammatory states of the malady, until after depletions have been carried sufficiently far, and we wish to procure the expulsion of the concrete exudations formed in the air-passages. They ought to be exhibited in small doses in the remissions, and pushed to the extent of producing vomiting when paroxysms of suffocation occur. After the membranous substances are removed, squills should be altogether laid aside. The *sulphuret of potassium* has been recommended by Professors SERF, CHAUSSIER, MERCIER, and HECKER, in doses of about four grains, given every three or four hours. It is sometimes of much service after depletions. It may be combined with camphor, or small doses of *ipécacuanha*.

70. *Antispasmodics* have been very generally prescribed, and particularly by MICHAËLIS, PINEL, SCHWILGUE, VIEUSSEUX, &c., after the decided use of antiphlogistic remedies. HOME, CHEYNE, and GOELIS, consider that these medicines are of little use in common and inflammatory croup. I am, however, convinced, from extensive experience, that, when the inflammatory symptoms are altogether, or even nearly, removed by antiphlogistic medicines, when the disease passes into a spasmodic state, or presents from the commencement a predominance of such symptoms, and when increased irritability becomes manifest, a judicious exhibition of antispasmodic medicines is often attended with benefit. *Musk*, either alone or with other medicines, with calomel (MICHAËLIS and WIGAND), with squills, sulphuret of potassium, or other expectorants, and with camphor or ammonia, in the last stage of the malady*; *valerian* and its

* The chief danger in croup often proceeds from the spasm with which the respiratory passage is affected in the progress of the disease. The obstruction of the tube by the false membrane and effused matter seldom of itself causes suffocation; but rather this lesion, combined with spasm of the muscles of the larynx and membranous portion of the trachea; and, in many cases, exhaustion is superadded, or even constitutes the most important change. Depletions alone will not overcome this disposition to spasmodic action, which is generally observed to supervene at intervals; the periods elapsing between the paroxysms varying according to the strength and constitution of the child and the severity of the disease. But in many cases the spasmodic action is more frequent and more dangerous, and the more likely to become associated with convulsions, the weaker the constitution and powers of life, and the more those powers have been reduced by copious depletions. After moderate depletion, therefore, and in many cases even previously to any, such medicines as possess an antispasmodic power, by first acting as nauseants, are of great benefit. M. KIMBELL seems to have partly adopted this view of the disease and of its treatment; but I am confident he has carried it

preparations, *assafœtida*, or any of the other medicines of this class mentioned above, may be employed, either alone, or with expectorants and opiates, particularly when the energies of the system begin to be depressed, or the complaint assumes from the first a spasmodic character.

71. Of those medicines which are *antispasmodic* from their *sedative* operation, the most important are *colchicum*, *opium*, *hyoscyamus*, *hydro-cyanic acid*, *digitalis*, and *tobacco*. *Colchicum* may be given combined with calomel, in the early and inflammatory states of the disease, or with ammonia or camphor, at a later period; but it ought, in young children especially, to be exhibited with extreme caution,—in very small doses, and carefully watched. It came into fashion in this and other diseases of the air-passages a few years since and was, for a time, much employed; I then saw some cases of croup in which it had been very injuriously employed, from having been given in too large doses for the age of the child, or too long continued, or combined with other depletions, as antimony, &c., or exhibited after very large depletions. I can most truly assert, that I have seen at least two cases of croup, in which death was to be imputed to this substance, rather than to the effects of the disease; and yet it is sometimes of use when combined as I have now advised. Of *digitalis* I have had no experience in this complaint; if exhibited at all, it should be conjoined with calomel. *Hydro-cyanic acid* has been employed in some cases which I have seen, but the same objections I have urged against *colchicum* apply to it, when prescribed for young children. In older patients it is sometimes of benefit, combined with camphor, or oxide of zinc, or other stimulating antispasmodics, in combating the irritability and disposition to spasmodic paroxysms in the latter stages. *Opium* was much

much too far. If his success has been equal to what he conceives it to have been, the cases which he has met with have been unusually slight. There is no doubt of bleeding, blistering, purging by calomel, &c. &c., having been pushed to hurtful lengths in many cases, or inappropriately employed; and the same may be said as to other means, which have tended more to exhaust the energies than to cure the disease; and there can be no doubt of the disposition to spasm becoming greater as of its consequences being more to be dreaded, the powers of life sink; for, with such sinking, the general sensibility and irritability of the frame increase. I cannot conclude that those means could have been dispensed with in any considerable number of the cases which have fallen under my observation, and in which I have never omitted also to employ antispasmodics of the active nature, from a conviction that the disease partly depends upon spasm. Mr. K.'s observations as to the treatment of the disease are to the following effect:—"I do not bleed or blister a child in croup: I have never thought it requisite to do so, since I have adopted the plan alluded to; although such auxiliary practice would be in no respect incompatible, than as tending to invalidate the general strength. The treatment I allude to consists in confining the child to a uniform and rather warm temperature, giving an emetic of *ipécacuanha*, and, an hour after, commencing the following mixture:—

No. 164. R. Pulv. Valerianæ 3j.; Oxymel. Scillæ ʒj. Tinct. Opil gtt. xx.; Aquæ Destillatæ ʒj. Mistr. I administer a teaspoonful every hour, if the child is from two to five years old; if from five to eight, every five or forty minutes, so as to maintain the anodyne effect of opium, and the sub-nauseant, expectorant, antispasmodic effects of the squill and valerian, until the symptoms are removed; which commonly happens in ten or twelve hours, and which I have never seen protracted beyond eight and forty. On their subsidence, I have, in general, given a brisk dose of calomel and jalap."

Mr. K. likewise recommends the above treatment in whooping cough and in catarrh; and in those cases which are unconnected with inflammatory action, it is not inappropriate. In the slight and more spasmodic states of croup, it also will prove very beneficial.

the wearing of flannel next the skin, and of a neckcloth in winter and spring; light nourishing diet, with strict attention to the secretions and excretions; immediate recourse to medicine upon the appearance of catarrhal or croupal symptoms; and a careful avoidance of exposure to cold and moisture. When croup occurs in one child of a family residing in situations where it prevails, more will probably be attacked. In such cases, removal to a healthier air is requisite. When it is prevalent either in a simple or complicated form, and particularly when the locality also increases the risk of seizure or relapse, the occasional exhibition of small doses of calomel and James's powder, or of hydrarg. cum creta with the carbonate of soda, or the having recourse to either of them every second or third night, may be tried. In this country, care should be taken not to expose children to the north-east winds of spring, particularly when they follow heavy rains, &c.

76. *B. The Diet and Regimen*, in the more acute and inflammatory forms of croup, should be strictly antiphlogistic; and all food should be withheld until the stage of exhaustion supervene, when, if light nourishment can be taken, or be desired, it should be given. In the more spasmodic or prolonged forms, light food may be taken in small quantity. The best beverage of which the patient can drink is a very weak decoction of marsh-mallows and liquorice root, to which a little candy and bi-borate of soda are added. The temperature of the room should be moderately and equably warm.

77. *C. During Convalescence*, change of air, as soon as it can be safely permitted, is especially beneficial; and strict attention ought to be paid to the prophylactic means stated above (§ 75.), in order to prevent a relapse or recurrence of the malady. These precautions are required during, and for some time after, recovery from the complications and consecutive affections of croup, as well as from its simple forms. In the winter and spring months especially, the convalescent should be kept in apartments moderately and as equably warm as possible.

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this connection, consider, 1st, The primary or direct states of debility; 2dly, Its consecutive or secondary conditions; and, 3dly, Those forms, consisting not only of depressed, but of otherwise morbid or vitiated, vital manifestation — or complicated debility. After having discussed these topics, with reference to *general debility*, the *more special or partial states of debility*, and its consequences, will be brought into view; and the subject pursued in its relation to general and special pathology.

5. I. CONDITIONS OF DEBILITY. — i. PRIMARY DEBILITY (*Direct*, BROWN; *True*, HUFELAND; *from Abstraction of Stimuli*, RUSH and BOISSEAU). This state of debility is not so frequent as is commonly supposed, although by no means so rare as BROUSSAIS and his followers contend. Many of the cases commonly imputed to it strictly belong to the other conditions specified above (§ 4.). Primary debility may be, (a) *Original*, or congenital; and (b) *Acquired*. — A. The former of these is observed in the children of exhausted, dissipated, or aged parents, — especially the male parent, — and is familiar to every common observer. It also presents itself in the infants of those who are of a strumous diathesis, although generally in a slighter grade, and more frequently obscured by concurrent disease of particular organs. This form of debility seldom continues long without being followed by some specific malady, which it either remarkably favours, or even more directly produces, — causes, which are innocuous as respects infants of originally sound stamina, variously affecting, and ultimately blighting the debilitated offspring.

6. B. *Acquired* debility presents itself to our notice in every stage of life. If it supervene in infancy and childhood, it may be, to a certain extent, perpetuated in the constitution through life. But, in whatever period it may occur, it is most frequently the consequence of the *abstraction of stimuli* necessary to the excitation and perpetuation of the vital manifestations to a requisite extent. — (a) The infant that is not *sufficiently*, or is injudiciously, or *unnaturally nourished*, if it escape any of the maladies to which it is thereby disposed, becomes pale, languid, soft, and enfeebled, or altogether diseased: it wastes; its flesh is flabby; its growth is impeded; and it at last is the subject of anæmia, or of tubercles, or of worms, or of disease of the digestive canal, of the mesenteric and other glands, or of the joints and bones. But insufficient or inappropriate nourishment affects all periods of life in nearly a similar manner. A fish diet through life gives rise to a weaker conformation of body than food of a mixed kind. This was proved by PEARSON in respect of the natives of Van Diemen's Land. Similar effects follow an exclusively vegetable diet, although not to so manifest a degree. It should, however, be admitted that those who are obliged to live on one kind of food alone are more liable to experience insufficient supplies of it. — (b) The abstraction of the *animal warmth* is another cause, occasioning a modified, and, as it were, an acute form of debility, followed by peculiar effects, which are fully described in the article COLD. — (c) The *privation of solar light* has a marked influence on the vegetable creation; plants being pale, sickly, and imperfectly developed,

and their proper juices scantily and insufficiently elaborated. An analogous effect is produced by the same cause on the animal creation, and particularly on man — the body becoming pale, sickly, and etiolated; the senses remarkably acute; the general sensibility and muscular irritability much heightened; the organic actions readily influenced by the slightest external agents*; and the circulating fluids thin, watery, and deficient in albuminous constituents, and red globules, and in quantity. Facts illustrative of this occurrence are adduced in the article on anæmia, which is thereby produced. (See BLOOD, *Deficiency of*, § 41.) The physical and mental debility resulting from confinement in dungeons and dark cells is to be attributed to the exclusion of light, restricted diet, want of exercise and of free air, and to moral causes combining with these in depressing the vital powers, and ultimately producing disease of a low and dangerous form. — (d) Intimately con-

* The remarkable and authentic history of CASPER HAUSER, by the President VON FÜRERBACH, furnishes striking illustrations of the above. The accounts which have been recently published of this person should be attentively perused by every pathologist and philosopher as being most singular and instructive. Casper Hauser was kept, from infancy until he was eighteen years of age, in a perfectly dark cage, without leaving it; and where he neither saw a living creature, nor heard the voice of man. He was restricted from using his limbs, his voice, his hands, or senses; and his food consisted of bread and water only, which he found placed by him when waking from sleep. When exposed in Nuremberg, in 1828, he was consequently, at eighteen years of age, as if just come into the world; and as incapable of walking, discerning objects, or conveying his impressions, as a newly born infant. These faculties he, however, *acquired*; and he was placed under an able instructor, who has recorded his history. Darkness had been to him twilight. The light of day at first was insupportable; it inflamed his eyes, and brought on spasms. Subsequently the odour of which could not be perceived by others produced severe effects in him. The smell of a glass of wine, even at a distance, occasioned headach; of fresh meat, sickness, &c.; and of flowers, painful sensations. Passing by a churchyard with Dr. DAUMER, the smell of the dead bodies, although altogether imperceptible to Dr. D., affected him so powerfully as to occasion shudders, followed by feverish heat, terminating in a violent perspiration. He retained a great aversion, owing to their disagreeable taste and smell, to all kinds of food excepting bread and water. When the north pole of a small magnet was held towards him, he described a drawing sensation proceeding outwards from the epigastrium, and as if a current of air went from him. The south pole affected him less; and he said it blew upon him. Professors DAUMER and HERRMANN made several experiments of this kind, and calculated to deceive him, and, even although the magnet was held at a considerable distance from him, his feelings always told him correctly. These experiments always occasioned perspiration, and a feeling of indisposition. He could detect metals placed under oil-cloths, paper, &c., by the sensations they occasioned. He described these sensations as a drawing, accompanied with a chill, which ascended according to the metal, more or less up the arm; and was attended with other distinctive feelings, the veins of the hand exposed to the metal becoming visibly swollen. The variety and multitude of objects which at once came rushing upon his attention when he thus suddenly came into existence — the unaccustomed impressions of light, free air, and of sense — and his anxiety to comprehend them — were too much for his weak frame and acute senses: he became dejected and enfeebled, and his nervous system morbidly elevated. He was subject to spasms and tremors; so that a partial exclusion from external excitements became for a time requisite. After he had learned regularly to eat meat, his mental activity was diminished: his eyes lost their brilliancy and expression; the intense application and activity of his mind gave way to absence and indifference; and the quickness of apprehension became diminished. Whether this change proceeded from the change of diet, or from the painful excess of excitement which preceded it, may be questioned. My limits admit not of my adding more. The whole account is most important — the more so as the physiological facts stated in it may be relied on.

well as other parts immediately controlled by the cerebro-spinal system, have their functions enfeebled and impaired in proportion to the debility it experiences. But they may also be individually affected, and in various degrees, without this system being materially disordered. Such occurrences generally arise from the operation of local causes, — as over-excitement of the organ, and exhaustion of its sensibility by its peculiar stimuli; as weakness or loss of sight from over-exertion, or the intense or prolonged action of light; and loss of hearing from great noises, &c.

18. *D. The muscular structures*, from their connection with the ganglial and cerebro-spinal systems, necessarily experience the effects of depression of the energies of these systems, varying, according to its acute and chronic form, its degree, its simple or complicated state, and the progress it has made. But debility seldom originates in, or is limited to, these structures. Its earliest and simplest manifestations in them are diminished tone, flaccidity, wasting, particularly of voluntary muscles; lowered, or in some cases, morbidly increased irritability, according as the nervous systems experience a diminution or increase of their susceptibility (§ 17.); occasioning, in some cases, irregular and tremulous motions, and a disposition to spasmodic or convulsive action, but more frequently defective energy of contraction, or power of continuing and repeating it, in both the involuntary and voluntary classes of muscles. In the more acute, or the more advanced and complicated states of adynamia, the insensible tonic contractility of muscular fibres are in a great measure lost; their vital cohesion is also so much diminished as to admit of their being more easily torn; they are incapable of performing even a portion of their functions; and their contractions are feeble, vibratory, or oscillating, productive of the utmost fatigue, sometimes of death; and the least exertion, even that requisite to preserve the body recumbent upon one side, cannot be sustained for a few minutes. These extreme states of debility occur in the most dangerous and severe cases of disease, as in adynamic fevers, scurvy, &c., and when the circulating and secreted fluids have become sensibly changed from their healthy condition.

19. *E. The sexual organs*, whilst they participate in the vital depression of the general systems, are often themselves chiefly affected. It is by no means uncommon to meet with instances, particularly in the male sex, of the most complete debility of these organs, amounting sometimes to entire loss of function, from precocious and inordinate excitement and indulgence; there being little or no other disorder, excepting enfeebled mental manifestation, in some cases. In others, however, all the organic and cerebro-spinal functions have become remarkably weakened, although not to the extent experienced by the organs in question. (See IMPOTENCY.)

20. *iii. The Manifestations of Debility in particular Tissues* are less evident than in the general systems and associated organs; and they are later in becoming evident. It is usually not until they are extreme, long-continued, or complicated, that they are remarkable. — (a) The *cellular tissue* at first evinces deficient firmness and elas-

ticity, with softness, and, as debility increases, loss of its vital cohesion: it at last presents a tendency to cedematous or serous infiltration, and even to hæmorrhage, owing to weakness of the extreme vessels terminating and originating in it, and the insufficient support it yields them. When it is thus changed, the spread of other diseases through it is thereby remarkably promoted, and an unfavourable termination hastened, — as in cases of diffusive inflammation, erysipelas, punctured or poisoned wounds, &c.; its vessels having lost their power to limit the extension of inflammation by forming coagulable lymph. — (b) *Mucous membranes* are amongst the earliest of the particular tissues to experience the effects of debility, thereby increasing and perpetuating many of its phenomena. At first their functions merely are impeded; their secretions either diminished, or imperfectly excreted, or increased from relaxation of their vessels, or in other respects vitiated. As debility, whether of them especially, or of the frame in general, advances, vital cohesion becomes impaired, and they yield not the requisite support to their vessels; whence result softening, hæmorrhage from their surface, ecchymosis, asthenic ulceration, atrophy, &c. — (c) The *serous tissues* undergo a partial diminution of their cohesion, and permit an aqueous or serous fluid, in some extreme cases tinged with blood, to escape through their exhaling pores. — (d) The *erectile textures* at first evince greater susceptibility, particularly when debility has been induced by inordinate excitement of the sexual organs; but as it increases they lose their peculiar functions. — (e) The *fibrous tissue* also experiences relaxation, becomes less elastic, and more readily yields than in health, giving rise to almost spontaneous dislocations, — results which have occurred in the chronic debility caused by masturbation, as remarked by Sir ASTLEY COOPER and Mr. COPLAND HUTCHISON, and by myself in one case. — (f) The *osseous texture* occasionally experiences, in children, an imperfect deposition of ossific matter, or even absorption of a great part of that already secreted; and, in aged persons, the removal of the animal matter which gives due cohesion to this structure: and, (g) The *corneous tissues* are often variously changed; the hair either falling out, or becoming thin, weak, or grey; the epidermis inclined to exfoliate, and rough or scaly; and the nails thin, long, crooked, or irregular.

21. *III. DEBILITY OF THE WHOLE FRAME.* — Debility seems, as already stated, most frequently to originate in the ganglial and vascular systems, which I have viewed as the chief factors of life; the digestive, assimilative, excretory, and cerebro-spinal organs being subsequently affected. But it may also commence in, and continue for a considerable time limited to, either of these, or even, although rarely, to one or more of the individual tissues. When existing thus locally, it usually springs from local and indirect causes, and is at first of a slight grade, the functions of the part merely being impeded: but, as it continues, the rest of the economy becomes implicated in various degrees, owing to the reciprocity of vital action and function existing throughout the frame. With this universal diffusion of asthenia, the part primarily disordered may still continue affected in a greater degree, exhibiting the changes of func-

tion, and even of structure, now briefly sketched in respect of the principal systems, organs, and tissues, according as they may be implicated; but in many instances, the debility becomes co-ordinate throughout; and in rare cases, the part originally affected even partially recovers its powers upon some other organ having its vital energies more remarkably depressed.

22. IV. CHARACTERISTIC SIGNS, &c. — When asthenia is thus general and fully developed, the external aspect of the body, and all the vital functions, are affected; the extent and specific characters of ailment furnishing important pathological as well as therapeutical indications to the practitioner: — The countenance is pale, thin, or collapsed, sometimes bloated and discoloured: the eyes lose their animation, and sink in the sockets, and they are surrounded either by a dark or bluish, or by a tumid and œdematous, circle; the expression of the features is languid and depressed; the lips are pale; the tongue watery, moist, soft, broad, and sometimes tremulous, and the papillæ depressed and wasted; the voice and speech are weak, or nearly lost; the voluntary muscles lose their powers, and hence, in extreme cases, the continued supine posture, the inability to retain a position on either side, the sinking down in bed, and the falling of the head on the breast or on either shoulder. The surface of the body has its temperature diminished, is sometimes partially covered with a cold or clammy perspiration, becomes soft and flabby, occasionally of a more lurid or dirty hue, or pale and waxy, particularly in complicated debility; the firmness and elasticity of the soft solids are lost, and they either present a leucophlegmatic appearance, or they are remarkably emaciated, — the latter being particularly the case when the circulation is accelerated. The functions of the stomach and bowels are impaired, or altogether suppressed; and hence the want of appetite, the constipation, and emaciation, — which last affects first the adipose tissue, and next the cellular and least vitalised structures. When the depression is very great, the vital attraction requisite to the nutrition and healthy cohesion, especially of the more remote and superficial parts, being necessarily diminished, the function of absorption gains the ascendancy; and the less perfectly animalised constituents, particularly the adipose substance and the effete elements, are carried back into the circulation; and thus, in some states of disease, the body continues to live upon itself, until the functions are restored, or life extinguished; the external soft solids, attached to, or covering, the bones, meanwhile becoming remarkably attenuated. In general, the pulse is frequent, soft, small, and easily compressed; the action of the heart is weak, and leipothymia or syncope occur upon exertion, or on quickly assuming the erect posture. Respiration is frequent, imperfect, or anxious or difficult, and the motions of the thorax are slight and confined. The functions of the cerebro-spinal system are more or less enfeebled; and, with the changes described above (§ 17.), present the following phenomena: — Loss of memory; inability to prosecute a lengthened chain of discussion, or to fix the attention long on one subject; sometimes weakness, with hebetude of all the faculties; an unpleasant feeling of languor, and exhaustion, with a sense of anxiety referable to the præcordia and pit of the stomach; vertigo or

headach; noises in the ears, either with or without impaired hearing; weakness of the limbs, and relaxation of the ligaments of the joints, with tremors, occasionally convulsive movements, or local paralysis; and ultimately low or quiet delirium.

23. V. DIAGNOSIS. — A distinction has usually been made between *real* and *spurious debility*. The latter term, however, implies a contradiction. But as it is the morbid condition, and not the name imposed upon it, that requires notice, I may briefly allude to it. The state of system, to which this name has been applied, would be better expressed by denominating it *oppression of vital power*; this, or nearly similar appellations ("*oppressio virium*," "*debilitas ab oppressione*"), having been employed by several modern pathologists. The vital manifestations may be generally or partially *oppressed* by whatever impedes their free reaction in removing the impression produced by injurious agents, or by whatever arrests the function of an important secreting organ or vital emunctory, whereby the vascular system becomes overloaded, and consequently oppressed throughout, as well as in the organ whose functions have been interrupted. The distinction will be more easily understood by a reference to facts. — During pneumonia, the lungs perform their functions in respect of the blood imperfectly, and the various secretions and excretions are diminished. Hence the quantity of the circulating fluid is increased; the circulation through the inflamed lung rendered difficult; the functions of the organ impeded, and the vessels generally distended beyond their power of reaction upon their contents, so as to restore the suspended functions. In such cases, the pulse is suppressed, and not much accelerated; but it conveys the sensation of a confined limit of pulsation, thereby suggesting the idea of a sustained state either of tonicness which the systole of the ventricle cannot much affect, or of distensibility upon which the elasticity of the vessel reacts imperfectly in the intermissions between the systoles. That this state actually obtains is shown by the effects of blood-letting in changing the character of the pulse, in removing the feeling of oppression, and in partly restoring the strength. Inflammations of other organs — as the liver, brain, &c. — also furnish instances of oppression of vital power. In all these, however, the state of the surface of the body, and other symptoms above noticed as characterising true debility (§ 22.), do not exist. In fevers, also, the reaction following the impression of the exciting causes is very generally attended by oppression of the powers of life, owing, in some cases, to an overloaded state of the circulation from interrupted secretion, &c.; and, in other cases, partly to this circumstance, and partly to the depressing influence produced by these causes still continuing, and, jointly with the increase in the quantity of the circulating fluid, favouring congestion of internal secreting and vital organs. Hence, in several forms of these diseases, a complicated pathological state is the result; viz. *depression*, followed by *oppressed*, vital power, as soon as attempts at reaction begin to be made, in order to overcome the injurious impressions, and changes occasioned by the exciting causes. This suppression of power may arise out of true

debility, may be associated with it, and terminate in it, in its worst and complicated states.

24. The *DURATION* of debility is extremely various. It may, particularly when acquired and slight, be remarkably long, or continue through life, which it may not even abridge. When rapidly and *primarily* produced, or general and intense, or complicated, it is usually *acute* as respects its continuance; but when *consecutive*, or partial, or the result of irritation of particular textures, it is prolonged into the *chronic* state; its duration depending greatly upon its degree, and both being extremely various.

25. VI. *PATHOLOGICAL RELATIONS.* — i. The *CONSEQUENCES AND TERMINATIONS* of debility are, (a) Impeded or interrupted secretion; (b) Changes of the circulating fluids; (c) Various states of irritation or inflammatory action, in particular organs or tissues; (d) General reaction of the vascular system, associated with various grades of vital power, from the lowest, or most *asthenic*, to its highest, or most *sthenic* form, with their modifications; (e) Changes in the firmness, elasticity, nutrition, colour, form, and vital cohesion of the soft solids, and, in some instances, ultimately in the hard solids also; (f) Effusions of fluids (aqueous, serous, sanguineous, &c.) from mucous or serous surfaces, or in cellular or parenchymatous structures; (g) The production of numerous forms of organic change; (h) The formation of new or adventitious tissues or productions, as tubercles, tumours, melanosis, cancer, hydatids, worms, gangrene, &c.; and, (i) lastly, *Death*, which may occur directly from the intense action of the depressing cause, but more commonly through the medium of one or more of the changes now enumerated, the first and greater part of which often taking place consecutively.

26. ii. *ASSOCIATIONS OF DEBILITY.* — *Asthenia* is very frequently connected with some other morbid condition, implicating either particular parts, or the system generally. Amongst these are the *consequences* now enumerated (§ 25.); but the most important are, (a) The association of depressed with otherwise modified or morbid states of the vitality of the system; (b) with a vitiated condition of the blood and secreted fluids, either or both of which constitute the complicated debility already mentioned (§ 11.); (c) with a disposition to solution of the textures generally, or of a part merely, as in malignant fevers; (d) with congestions, and chronic or acute inflammations of particular organs or structures, as in complicated forms of fever, erysipelas, diffusive inflammations, dysentery, &c.; (e) with intestinal worms, hydatids, and various malignant and adventitious formations.

27. A knowledge of the pathological relations of this most important and singularly overlooked condition of vital power is necessary to the practitioner, inasmuch as it enables him to entertain enlarged and connected views of disease, by the aid of which he may the better comprehend such states of disordered action as cannot be readily assigned to any particular type or specific form, owing to their imperfectly marked characters, the associated disturbance of different organs and structures, and the want of prominent symptoms whereby they may be ascertained. Debility not only constitutes, in its more intense forms, dis-

ease itself, and a most serious part of many of the most dangerous maladies, but it also *predisposes* the body to be affected by the numerous injurious agents to which it is constantly exposed.

28. iii. The *PREDISPOSITION* to be affected by the exciting causes of disease, arising out of debility, will necessarily vary with the form and grade it assumes, and the circumstances in which it has originated. This proposition is too evident to require illustration. But when the debility proceeds from irritation of one or more structures abstracting vital power from the rest (§ 9.), it may not increase, but may, in some cases, diminish, predisposition, particularly when it is attended by exalted sensibility and accelerated circulation. Thus the debility attending irritation in any part of the respiratory organs even diminishes the disposition to be affected by malaria, and infectious or epidemic agents. So much, however, of what constitutes liability to diseases is owing to the temperament, diathesis, the modes of life, and habit of body, as well as to general or local debility, that the exact share of each can rarely be ascertained. General debility, either in its direct or primary form, or as consecutive of over-excitement, disposes the system to be affected by terrestrial emanations, vicissitudes of season and weather, and infectious effluvia. The more local or partial states of debility, particularly when existing in secreting organs and the associated structures, render them liable to congestions, inflammatory irritation, to disordered secretion and excretion, to spasmodic or convulsive movements, to effusions, to various states of inflammation, and organic change, with the other *consequences and associations* of debility above enumerated (§ 25, 26.), upon exposure to causes which disturb the *balance* of vital manifestation throughout the frame in a sudden or violent manner, or which impede the assimilating and depuratory functions, and thereby disorder the vascular actions and the circulating fluid. (See *DISEASE — Causes of.*)

29. VII. *TREATMENT.* — In attempting to remove debility, our means should be directed with a strict reference to its form, grade, and complication. These, however, are so numerous, that precise rules of treatment cannot be laid down; the only attempts of this kind that can be made, falling more appropriately under those diseases of which depressed vital power forms an essential part. (See especially the *FIRST CLASS* of the author's classification.) In the treatment of debility, in either its simple or associated states, there is a particular class of remedies, viz. *tonics*, which are more beneficial than any other; although many articles belonging to other classes, as diffusive stimulants and antispasmodics, may often be prescribed, and with great advantage. Tonics, which have derived their name from their influence in augmenting the tone of contractile parts, owe the principal part of their good effects to their elevating, in a gradual manner, depressed vital power, hardly up to, and seldom or never above, the healthy standard; and to the permanency of their action. By their repetition before the effects of the previous dose have subsided, the beneficial influence ultimately is propagated throughout; and as soon as one or more important functions are restored, the rest participate in the change, and the whole assume

necessary, to select those which are the least heating, and to exhibit them along, or alternately, with such medicines as will promote the secretions and excretions most requiring aid, and with internal and external derivatives from the principal seat of disease. In cases of this description, particularly in the young, and in those who previously enjoyed a sound constitution, the returning energies of life generally stand but little in need of a spur; they require rather a judicious guidance, especially in respect of the digestive, the secreting, and excreting functions.

37. iii. *Complicated Debility*, or that condition of the frame which consists not merely of a depressed, but of an otherwise morbid state of vital power, has been ascribed above—1st, to unwholesome food, and to imperfect assimilation; 2dly, to an impure or altered state of the circulating fluid, occasioned by impeded or disordered secretion and excretion; and, 3dly, to the absorption of morbid matters into the blood, either from some one of the mucous surfaces, or from parts of the body in which they have been generated. The operation and effects of these sources of contamination have been fully insisted on in the articles *Absorption*, and *Blood* (§ 110—151.). The indications of removing them may be resolved into the following:—1st, To cut off the supply from the sources of contamination; 2d, To raise the powers of life, as expressed chiefly in the *ganglial* and *circulating systems*, by the means pointed out under that head (§ 31.); 3d. To promote the depuratory actions of the emunctories.

38. A. The propriety of endeavouring to accomplish the first of these intentions cannot be questioned; but, when the contaminating matters are formed in some part of the system, as in various malignant diseases, apparently local at their commencement, it frequently cannot be put in practice, or the period at which it might have been attempted with any prospect of success may have passed, and the other intentions are our only resort.—B. The second indication is to be fulfilled by the remedies already noticed (§ 31.), and the treatment recommended in the article *Blood* (§ 157.); particularly by the alkaline chlorates; the preparations of bark, of iodine, of iron, of arsenic, or of zinc; by astringents and antiseptics, as the acetic and citric acids, &c.; by the preparations of the bitter roots and woods, or of the aromatic and tonic barks, with liquor potassæ, or the alkaline carbonates, in the more chronic diseases, and with the sulphuric, the hydrochloric, or nitric acids, in the more acute maladies, and with warm spices, &c.; and by the gum-resins, the balsams, the terebinthines and camphor, prescribed according to the circumstances of the case.—C. But whilst we are endeavouring to elevate vital energy by those and other means, we should also fulfil the third intention, by associating, or alternating, them with the more tonic and stomachic purgatives, or with warm and stimulating diaphoretics, as the abdominal or the cutaneous secretions may require to be promoted.

39. iv. *Debility affecting chiefly associated organs, or particular textures*, requires nearly similar means to those already advised, according to the grade and form it may assume. The treatment of

its manifestations in the *ganglial* and *vascular systems*, and in the *digestive viscera*, has been already noticed; and is still more particularly discussed in the articles *Blood*, *Colon*, *Induration*, &c.—A. Debility of the *cerebro-spinal organs*, must be treated according to the causes that have occasioned it, and the characters it presents. The causes, whether moral or physical, should be removed or counteracted as far as possible; and if it have arisen from mental excitement, repose and agreeable amusement should be inculcated. (a) When it is characterised by increased *sensibility*, the bitter infusions with liquor potassæ or the carbonates of soda or potash, with *conium* or *hyoscyamus*; the preparations of iron; *chalybeates*; vegetable tonics and aromatics, with small doses of opium or the preparations of *nuxomphia*; cold or shower baths; sea-bathing, change of air, &c., mental tranquillity, and agreeable employment, are amongst the most efficacious means. (b) If it be attended by increased *irritability* or *mobility*, the mineral acids, alone or with bitter infusions; the preparations of *calcchona*; the acetic acid; *Hoffmann's anodyne*, *valerian*, *assafoetida*, *musk*, or vegetable tonics, with opiates or anodynes, the hydrocyanic acid, the Iceland moss, ass-milk, alkaline or tepid bath, &c., are suitable remedies. (c) If the debility be great, and particularly if it be attended by *torpor* or depression of the sensibility, depending either upon cerebral congestion, nor upon a plethoric state of the vascular system, the warm or dissoluble stimulants, combined with permanent tonics, aromatics and cardiacs; iodine, strychnine, or the extract of *nux vomica* in small doses; *camphor* or *phosphorus* in minute quantities; warm salt water bathing; the shower bath; *chlorine* fumigating baths; the use of astringent and camphorated washes to the head and surface of the body; the nitro-hydrochloric acid bath, or sponging the surface of the trunk, or even the head itself, with a tepid wash, containing these acids, may be tried and associated with the foregoing, or other internal remedies, according to the peculiarities of the case.

40. B. The *sexual organs* are debilitated—(a) from imperfect development depending upon their interrupted evolution, or upon general *asthenia*; and (b) from over-excitement. The first of these causes seldom occurs in the male, but is infrequently in the female (see *Chlorosis*, and *Menstruation*), and in such cases requires the constitutional treatment there described. The second cause is common to both sexes, although perhaps more so in the male than female. When it has thus originated, and exists merely in a slight degree, without amounting to impotency, the organs will recover their energies soon after marriage, if regular and abstemious habits be adopted. In other circumstances, and in severer cases, attention should be paid to the general health: the mind ought to be occupied by interesting pursuits, the patient should rise early in the morning, and use the shower bath, or local aspersion or affusion, and live regularly. If the causes in which it originated be relinquished, the sexual function will be restored. The tonics which are the most efficacious in cases of this description are, the use of the sesqui-chloride of iron, taken in the infusion of quassia, or of chamomile flowers; the use of iodine; coffee; and the extract of *conium*.

the skin is entirely incapable of absorbing fluids in which it may be immersed, has led to the neglect of *medicated baths*. But it should be recollected that, independently of any power of absorption this structure may possess, — and which I believe it possesses under some circumstances, and in respect of various agents, — it is a living, an active, a finely sensible, and, as to the nature and extent of its functions, an important organ; and that it is very susceptible of impressions by which not only its own functions are modified or altogether changed, but the actions of other organs are variously affected in consequence of the nervous and vascular connections and functional relations, which bind the different parts of the economy into one indivisible whole. Entertaining such views, I believe that cold, tepid, warm, or medicated baths; that lotions or washes, or stimulating liniments and frictions applied to the surface, — the former in slighter cases, the latter in the more urgent; are not infrequently beneficial in diseases of debility, when judiciously employed, and with due reference to antecedent or existing visceral disorder. Sea or salt water bathing; shower baths; camphor and chalybeate baths; warm, tepid, or cold baths, either general or local, of iodine, or of iodine and carbonate of potassa; baths of decoctions of willow or oak bark, sometimes with the addition of an alkaline carbonate; washes with camphor water, rose water, and vinegar, applied to the trunk; or sponging the surface daily with a mixture of these, at a temperature of about 60°; or with a small proportion of the nitric and hydrochloric acids in water at a temperature of 70° to 80°; are respectively of much service, when suitably prescribed.

46. *B. Moral treatment*, or attention to such mental impressions and emotions as are calculated to promote the physical means resorted to, is particularly beneficial in restoring the vital powers, especially when the nervous systems manifest a more than ordinary share of depression and its attendant disorders. The manner and bearing of the physician, when calculated to inspire confidence, will of themselves do much in fulfilling the intentions of his prescriptions. The faith reposed in the remedies resorted to will often accomplish as much as they are physically capable of performing, and not infrequently much more. In order to inspire this feeling, the physician should himself evince a calm, and, in cases of great danger and depression of the vital energies, a cheerful confidence. Hope, in whatever form it may be excited, and in every degree to which it can be elevated, is a most powerful agent in combating diseases of debility; whilst its opposite, despondency, — the consequence and the cause of debility, — is one of the greatest evils we have to guard against in these maladies. Every practitioner whose range of observation has comprised the malignant diseases of warm climates, or of temperate countries, must have remarked, that when the patient dreads, and still more if he entertains a sentiment of, an unfavourable issue, or if he be apathetic and careless of the event, the very worst sign of depressed vital power has appeared, and the most active moral and physical stimulants are then required; whilst, on the other hand, a firm confidence in the physician, and ardent desire of recovery, are

the best aids by which his endeavours can be seconded.

47. *C. Travelling*, — owing to the exercise, change of air, the continued succession of novel and exciting objects presented to the senses, the agreeable occupation, without exhaustion of the mind which attends it, and the amusing and exhilarating matters incidental to it, — is one of the most efficacious means of restoring the depressed or exhausted powers of the frame, especially the enfeebled functions of the digestive organs and of the nervous system; and nearly allied to it are pleasant society, rational amusements, and varied, interesting, but not fatiguing, bodily and mental employments.

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DEGLUTITION, DIFFICULT. — *Syn. Dysphagia* (from δύς, difficulty, and φάγναι, to eat or swallow). *Deglutitio difficilis* vel *imperfecta*. Auct. *Schweres Schlingen*, Ger. *Dysphagia*. Fr. *Dysphagy*. *Difficulty of Swallowing*.

CLASSIF. — 1. Class, Diseases of the Digestive Function; 1. Order, Affect.

lightning (PATERSON), and by severe cold (BLEULAND). It is, however, most frequently caused by the slow development of tumours, or cysts, or other structural changes about the base of the cranium, whereby either the nerves supplying these muscles are compressed at their origin or in their course, or a portion of the brain or of the upper part of the spinal chord is injured.

8. ii. **COMPLICATED DYSPHAGY**, or difficult deglutition from structural change affecting the parts immediately concerned in this function, comprises a great variety of lesions. I shall merely enumerate them with reference to their seat; their nature, morbid relations, and treatment, being fully discussed under more appropriate heads.

9. *A. Dysphagy from congenital malformation.*—Extreme smallness, or enlargement of the tongue; the termination of the pharynx, or of the œsophagus, in a cul-de-sac, or obliteration of the œsophagus; the division of this part into two canals, and its communication with the trachea; are the chief malformations which interrupt deglutition; and are of very rare occurrence in otherwise well-formed infants. Cases, however, have been recorded by BLAES, VAN CUYCH, MICHEL, BILLARD, MARTIN, A. COOPER, and ANDRAL. In these, death, necessarily resulting from inanition, took place in from three to nine days. A slight interruption to deglutition very frequently arises from congenital fissures of the soft and hard palates.

10. *B. From diseases of the mouth and throat.*—(a) Inflammation or chronic enlargement of the tongue; ranula; sublingual calculus (GUENTHER); and aphthæ, ulceration, tumours, and excrescences about the base of the organ (REIDLIN, VAN SWIETEN, TODE, and INGLIS); are not infrequent causes of dysphagy. Cases of chronic enlargement of the tongue, impeding deglutition, unconnected with malignant disease, and continuing for many years, are recorded by several writers. I have seen an instance of this kind, that had existed from infancy to nearly middle age. These and other affections, with the treatment appropriate to them, are particularly noticed in the article upon the *Diseases of, and the Indications furnished by, the TONGUE*.—(b) The *faucæ* and *tonsils* not uncommonly occasion dysphagy. Inflammation, suppuration, ulceration, or destruction of the soft palate, or of the uvula; great relaxation of the latter part; inflammation, abscess, chronic enlargement, and ulceration, of the tonsils; fungous and other tumours and polypi of the maxillary sinus, or posterior nares; various tumours or excrescences attached to the palate or tonsils (SCHMIDT, THILENIUS, &c.); and the severe effects of mercury, or the sudden arrest of salivation; are generally attended by more or less of dysphagy.—(c) When the pharynx is the seat of inflammation or of its consequences, or of the lesions now enumerated, or of malignant disease (KERGARDEC, and myself), deglutition is commonly much more impeded than when only the fauces are affected; and in some instances it is extremely difficult or nearly impossible. In such cases, the epiglottis and larynx are more or less irritated, and, by the consequent disorder of the respiratory actions, the dysphagy is still further increased. Foreign, and particularly pointed or sharp, bodies lodged in

the pharynx, are also sometimes causes of dysphagy.

11. *C. Dysphagy from disease of the epiglottis and larynx.*—(a) Inflammation, ulceration, and entire destruction of the epiglottis, or induration, incurvation, and the removal of it by wounds, will occasion difficult deglutition, as in the cases recorded by MAYNWARING, SCHUBERT, BONET, DESGRANGES, TONANNI, and LARREY.—(b) Also inflammation and ulceration of the larynx, ossification of its ligaments, and displacement of the *os hyoides*, are generally attended by dysphagy. The possibility of the occurrence of this last cause, although observed by VALSALVA, and MOLLINELLI, has been doubted; but the instance of it noticed by SIR C. BELL (*Surg. Observ.* p. 160.), and the case wherein it was caused by swallowing a large hard substance, recorded by Dr. MUONA (*Annali Univers. di Med.* Nov. 1828.), put the matter at rest. Fracture of this bone by external violence has produced not only an impossibility of deglutition, but even more serious consequences, as shown in the cases published by Dr. MARCINKOWSKI and M. LALESQUE (*Journ. Hebdom. &c.*).—(See *LARYNX — Diseases of.*)

12. *D. Diseases of the œsophagus, and cardiac orifice of the stomach*, will impede or altogether obstruct deglutition. Inflammations and their consequences, as softening and ulceration, induration, thickening, stricture, and purulent collections between the coats of these parts; also partial dilatations, sacs and diverticula, or even large pouches, either with or without thickening and stricture of the part of the œsophagus immediately below the dilatation (BLASIUS, HALLER, MECKEL, MONRO, LUDLOW, C. BELL, ODIER); polypus or fungous excrescences or tumours of various kinds in some portion of this canal, or in the cardiac orifice of the stomach; or scrofulous, callous, cartilaginous, osseous, carcinomatous, or scirrhus degeneration of these parts; or merely enlargement or ulceration of their mucous glands; and spasm, rupture, or perforation of the œsophagus, or the lodgment of foreign bodies in it, are severally causes of dysphagy; and are fully described in the articles on the *Pathological Anatomy of the DIGESTIVE CANAL*; and on the *Diseases of the CÆSOPHAGUS*, as well as in those of the *STOMACH*.

13. *E. Tumours pressing upon the pharynx, or upon the œsophagus*,—as bronchocele, or other tumours or abscesses near the throat and in the neck; tumefaction of the lymphatic and secretory glands below the jaw, and at the top of the sternum; aneurism of the subclavian or carotid arteries, or of the aorta before it passes into the abdomen; enlarged bronchial glands, tumours of various kinds, and abscesses in the posterior mediastinum; exostoses or other diseases of the cervical vertebræ, and purulent collections between them and the œsophagus (CARMICHAEL, myself, and others); also abscesses formed between, or involving, the trachea and œsophagus (HAY and myself); dropsy of the pericardium (BANG); and enlargement of the liver; have severally been observed to occasion dysphagy.

14. iii. The **DIAGNOSIS** of dysphagy requires a few observations merely.—(a) In *idiopathic*, as well as in the *sympathetic* dysphagy, the difficulty takes place suddenly, disappears as suddenly, re-

If *abscesses* have formed between the upper part of the oesophagus and cervical vertebræ, or between the former and the trachea, or about the pharynx, an unfavourable issue might possibly be averted by incisions made into them. If *aneurisms* press upon the gullet, the treatment recommended when discussing *Diseases of the ARTERIES* should be put in practice.—(e) When *thickening of the parietes* of a portion of the oesophagus, with more or less of *stricture* or *scirrhus* of this canal, or of the *cardia* of the stomach, is the cause of dysphagy, cupping, or leeches applied over the sternum; issues and moxas in the same situation, or in each side of the neck; the linctuses recommended above (§ 18. c.); mercurial and other alteratives, with conium, hyoscyamus, camphor, &c.; the iodide of mercury, or the iodide of potassium, internally and externally; the carbonates of the alkalies, or the liquor potassæ in emollients, &c., with various other means noticed in the article on the OESOPHAGUS, may be employed. If these fail, a careful trial may be made of the bougie; but the utmost attention should be paid not only to the manner of using it, but to the effects produced by it; for if the stricture be connected with sacs, pouches, or diverticula, or hernia of the inner coats through the muscular, or even with simple ulceration,—changes which not infrequently take place in the part immediately above the strictures—much mischief may result from even a cautious introduction of a bougie. The frequent and obvious connection of dysphagy with scrofula shows the propriety of prescribing the medicines found most serviceable in that disease, particularly when occurring in the scrofulous diathesis: and in such cases, the chloride of calcium or of barium, conium, liquor potassæ, and especially the preparations of iodine, should be fully tried.

19. C. The treatment advised by the best writers on this and its related affections consists of much that has been now stated; in addition to which, however, I may briefly add, that, the *chloride of barium* has been recommended by KERKSIO; *cold and iced fluids*, by TODE and MONTAT; *conium*, by WICHMANN, COLLOMB, HUFELAND, and JOHNSTON; *hyoscyamus*, by WITHERING; *opiates*, by FERREIN and CONRADI; the *liquor potassæ*, by HALLER; *emetics*, by FERREIN; and *local bleedings*, by FRANCK and BANG. Calomel and some other preparations of mercury have been prescribed by SEQUIRA, STEVENSON, ENGELHARD, BRANDIS, and others,—to the extent of producing salivation, by KRAMP, MUNCKLEY, BRISBANE, and FARQUHARSON—in the form of mercurial ointment, either alone or with the volatile liniment, rubbed over the sternum and throat, by DORSON, PATTEN, KERKSIO, and WATHEN—internally, with antimony, by VAN GEUN—and with aloes and camphor, by HALLER, PATTEN, BANG, and BRANDIS, who contend strenuously for the occasional origin of dysphagy in suppressed rheumatism and repelled eruptions, and also recommend

external derivatives and irritants, as sinapisms, issues, setons, blisters, repeated or kept open, &c. The surgical measures to be resorted to in various circumstances of the disease are fully discussed in the writings of J. HUNTER (*Trans. of a Soc. for the Imp. of Med. and Chirurg. Knowledge*, vol. i. art. 10.), DESAULT, (*Surgical Works*, &c.), RICHTER, (*Chirurg. Biblioth. b. xii. p. 11.*), C. BELL (*Surg. Observ. &c.*), and S. COOPER (*Surgical Dictionary*, &c.).

20. D. The diet should be chiefly farinaceous, excepting in the nervous and spasmodic forms of the disease; and it ought always to be easy of digestion, and taken without any heating condiments. All substances which irritate or excite by their direct or indirect action, are injurious. The stomach also should never be loaded; and in every circumstance, the secretions and excretions ought to be carefully regulated and promoted by gentle and appropriate means.

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DELIRIUM. — SYN. *Paraphrosyne*, *Paraphronia* (from *wapa*, erroneously, and *φρονία*, I understand), Auct. var. *Paracope*, Swedwar. *Irvereden*, *Aberwitz*, Germ. *Délire*, Fr. *Delirio*, Ital.

CLASSIF. — PATHOLOGY; Symptomatology.

1. Delirium has been defined: — Disorder of the intellectual powers, with or without derangement of the moral sentiments. But this definition is too extended and vague, and embraces the whole circle of mental diseases. J. FRANCK, and some

as in various other parts of the body), were so greatly enlarged as to impede deglutition and respiration. She had been treated by several eminent practitioners; but the tumours had increased. In consultation with Mr. ANNESLEY, who had requested me to see her, a course of iodine was recommended; and the iodide of potassium was employed, chiefly internally, for eight or nine months, with occasional intervals not exceeding a fortnight each. The glandular enlargements gradually subsided, the catamenia appeared, and she perfectly recovered. She is now well, and married.

of life, and by the recovery of the memory of languages and of ideas acquired at a very early age, and long forgotten. Thus old persons, when delirious, although their minds are blanks as respects every thing present, or which have become known to them from youth or manhood, will talk of matters which had interested them previously to such periods, and sometimes in a language which they had then spoken, but of which objects and language they had no recollection long before their delirium, nor retained any after their recovery. Here, again, the remarkable similarity between several manifestations of delirium and dreams is strongly evinced; the objects and ideas about which the unconscious mind is engaged in the states of both delirium and dreaming being frequently those which had made a vivid impression in youth, which had become erased by the cares and employments of life, but which are recalled during certain conditions of the brain. The production of these incongruous forms, and the giving utterance to the morbid conceptions formed of them, constitute *hallucinations*; whilst, owing to the nearly unconscious state of the mind, the imperfect and erroneous impressions made by surrounding objects on the senses of the patient, give rise to inconclusive and unconnected conceptions, in consequence of the morbid condition of the brain, and occasion the *illusions* characterising the delirious affection.

5. In addition to disorder of the mental powers, the organs of locomotion are remarkably affected. In the low or quiet delirium, and in the less dangerous states, in which the brain is only functionally deranged, the muscles are either somewhat agitated, or very much enfeebled, and the voice is very weak or nearly lost. In more severe cases, the voice and the muscular force are greatly increased; the patient, however, sinking into a state of profound collapse after a few violent efforts. In the most dangerous form of delirium, particularly when it proceeds from organic disease of the brain or its membranes, it is attended, but more frequently followed, by general convulsions, by spastic contractions of one or more of the voluntary muscles, by entire loss of consciousness and sensibility, or by paralysis.

6. C. Delirium, as M. GZONGET has remarked, may be *continued* or *intermittent*, even in the continued affections of the brain. When it is intermittent, it usually returns with the exacerbation of fever that takes place in the evening and night. When the patient recovers his reason, he is generally weak and exhausted; his senses are readily and painfully impressed by their respective stimuli; and he complains of thirst, and pains of the head and limbs. If the delirium has been slight, and consciousness has not been entirely abolished, he retains more or less recollection of what had passed during its continuance. But when it has been intense, or of some duration, he has no knowledge of what has occurred. The epidemic appearance of delirium mentioned by QUELMALZ (*De Epidem. Mentis Alienatione*. Lips. 1752.) and MICHAELIS (*Med. Pract. Biblioth. b. i. st. 1.*) is to be imputed to the prevalence of those diseases in which delirium is apt to supervene, and especially in that form on which it is most frequently an attendant. The duration of the

paroxysm of *intermittent* delirium varies from one to several hours; but the *continued* form, particularly when occasioned by disease within the head, may last several days, or even many weeks. Sometimes, as in the more severe cerebral cases, it alternates with profound coma. When it terminates fatally, it generally passes into coma; but in some instances the patient recovers his reason for a few hours before dissolution.

7. ii. DIAGNOSIS. — It is of the utmost importance that delirium should not be mistaken for *insanity*, and especially that the delirious patient should not be removed to an asylum for the insane. On two occasions I have seen such a mistake made, and about to be acted upon, when my opinion was requested. But these cases recovered perfectly: to one of them — a professional man — the removal to an asylum, or the supposition even of being insane, might have been ruinous. There can be no doubt that delirium often passes into insanity, especially when it has been caused by inflammatory state of the brain, and by fevers with determination to the part; or when it occurs in persons hereditarily predisposed to insanity; but until it has assumed the features of that form of mental disorder, it certainly in no respect should be viewed and treated as such.

8. The causes and circumstances originating *delirium* are often of themselves sufficient to show its difference from insanity. Its occurrence in the advanced stages of acute diseases, or of chronic maladies when the powers of life have become exhausted and febrile action of an acute kind has supervened, is especially characteristic of delirium. The *insane* patient has all his senses, as well as his digestive, assimilative, and locomotive powers, but little or not at all impaired. His mental faculties and intelligence are also but partially deranged. M. GEORGET has very justly remarked that the mental disorder of the insane is often confined to a single faculty; and even in the most extended, or maniacal affections, the faculties are rather perverted, or insulated, and without the bond of association, rather than extinguished. The most maniacally insane person wills and reasons, and is not always absurd in his actions. But in the delirious, all the cerebral functions are severely affected. His sensations are imperfect and incorrect, his ideas unconnected, his passions disordered, his voluntary motions irregular, feeble, and defective; his intelligence and recollection nearly abolished; and he is impassive to all that surrounds him. Whilst the *delirious* patient presents many of the physical signs of exhausted vital energy, or of the gravest state of disease, the *insane* has all the appearances of unimpaired health, particularly in the early stages of insanity, and before consecutive organic change has taken place. In the former, the sensations and perceptions are more or less abolished; in the latter, they are but little or not at all impaired, — the judgment only, or conviction of the understanding respecting them, being erroneous. The false conviction of the insane is too strong to be removed by the evidence of the senses: the sensations and perceptions of the delirious are always too weak, even when consciousness is partially present, to become the basis of sound

(*De Usu Nivis Medico*, cap. 25.). It may be prescribed in the form of cold affusion, pounded ice, cold epithems, evaporating lotions on the head, or simple sponging. If, however, it be continued too long, or after the morbid heat has been subdued, and the features have shrunk, it will be injurious, by depressing the nervous energies too low, and favouring the supervention of coma, or violent agitations, terminating in fatal exhaustion. It is required chiefly in the *third* form of the disease; but in the *first* and *second* forms, when the temperature of the head is increased, it should be cautiously employed, or the tepid affusion substituted for it. In these, however, I have preferred that the scalp should be sponged with a tepid and very weak solution of the nitro-hydrochloric acid. — (b) *Camphor* has been nearly as universally prescribed. BÜCHNER (*De Præstantia Camphoræ in Deliriis*. Halæ, 1763.), and TODD (in *Soc. Med. Hann. Coll.* ii. No. 34.) especially recommended it, — the latter with mineral acids. It is a most excellent remedy when judiciously exhibited. If given at all in the *third* form of the affection, it should be in small doses, with nitre and antimony, or with digitalis. In the *first* form, it may be prescribed in larger quantity; and in the *second*, especially if there be stupor or coma, or a morbid state of the blood, in still larger doses, with tonics, antiseptics, aromatics, and cordials. — (c) *Opium* or *hyoscyamus* is noticed by PERCIVAL (*Lond. Med. and Phys. Journ.* vol. i. p. 443.), GOUBIER (*Journ. de Méd.* t. lxxxv. p. 244.), DUPUYTRIN, and KORTUM (*Beiträge zur Pract. Arzneiwiss.* No. 9.). In some states of the *first* and *second* forms of the affection, when it is purely nervous, or is attended by much agitation, watchfulness, &c., either of these medicines may be employed. In the more doubtful cases, either of them may be safely exhibited with camphor and James's powder. In the *third* form, particularly when it assumes a *maniacal* or violent character, and after depletions have been carried as far as may be thought prudent, and the bowels have been freely evacuated, I have repeatedly seen a full dose of opium or hyoscyamus, given either alone, or with antimony, or James's powder, and camphor, produce the happiest effect. Any unpleasant symptom that may result either from too large doses of these narcotics, or from their inappropriate use, will readily be removed by the cold or tepid affusion on the head. The acetate or hydrochlorate of morphia, taken in a full dose of the spirits of pimenta, or in any other aromatic spirit, has proved equally beneficial with opium, in my practice. The external employment of opium has been found very successful in delirium, by V. CUNABURGI (*Sull' Uso Esterno dell' Opio*, 8vo. Flor. 1797.), WARD (*Lond. Med. and Phys. Journ.* vol. i. p. 441.), and PERCIVAL (*Ibid.* p. 444.), who have used it in the form of liniment (ʒj. triturated with ʒj. of adip. præp.), either with or without camphor. — (d) *Purgatives* have been justly praised by all writers on this affection. The ancients prescribed them in very large doses, and preferred the hellebores, which, with calomel and those I have already particularised, should be actively exhibited, according to the strength of the patient. When the debility is great, they must be associated with a tonic and stimulant treatment. — (e) *Emetics* have been mentioned by

several writers; and when delirium proceeds from the ingestion of narcotic, indigestible, irritating, or poisonous substances, or is connected with the accumulation of suburæ in the upper portions of the digestive tube, they are then requisite. — (f) *Antispasmodics* and *cordials*, particularly valerian (WARBURG, *Med. Beobacht.* No. 16.), assafoetida (WANTERS, *Journ. de Méd.* t. lvi. p. 115.), musk (KORTUM, *loc. cit.*), warm negus, and similar medicines, have been recommended; and are often of service, when the powers of life are much depressed. — (g) *Blisters* have been applied to the head much too indiscriminately: I have seen them prove most injurious in this situation. Dr. F. GILCHRIST, one of the best writers of his time, directs them both to the head and to the insides of the legs. I believe that they will prove beneficial in the former situation, only when the powers of life are sinking fast, and the delirium is attended by stupor, a cool head, and sunk or collapsed features, as in cases of low or adynamic fevers. When this affection is consequent upon febrile determination of blood to the head, blisters on the insides of the legs, &c. may be useful derivatives; but they often occasion too much pain and irritation in this situation, as to thereby counteract, particularly in the turbulent state of delirium, any good they might otherwise produce. — (h) Of the *sedatives* or *contra-stimulants* prescribed by writers, the preparations of antimony, particularly James's powder—digitalis, and the nitrate of potash, are the most deserving of notice. Wherever the delirium is connected with increased vascular action in, or determination to, the head, these medicines are of more or less service when judiciously combined with other appropriate remedies. WITHERING (*On Digitalis*, p. 33.) and PATTERSON (*Med. and Phys. Journ.* vol. v. p. 442.) strenuously advise the preparations of digitalis; but they, as well as those of antimony, require much caution, if ventured upon in the delirium attendant on low or malignant fevers. It is chiefly in the maniacal or *third* form of this affection that they are most beneficial, and in it they should be exhibited in a decided manner; but in the *first* and *second*, particularly in the delirium of typhus, they are generally injurious. — (i) The *actual cautery* on the nape of the neck, and *moxas*, have been advised by M. VALENTIN (*Med. and Phys. Journ.* vol. xix. p. 432.), and several other Continental writers. — (k) Dr. GRANT (*On Fevers*, 8vo. 1771.) recommends the patient to be allowed to dress and sit up when he feels anxious to do so; but this, and several judicious observations of this writer, are more fully adverted to in the article on FEVER. The observations made on convalescence from *Inflammations of the Brain*, and from FEVER, are perfectly applicable to the management of convalescence from delirium. (See these articles.)

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by the same cause; the one being immediately consequent upon or accompanying intoxication, the other commonly resulting from the abstraction of the accustomed stimulus, after an habitual or continued indulgence in it, or after a protracted fit of ebriety. A slight form of it, or merely tremors of the hands or limbs, with deficient nervous power, and occasional illusions, will sometimes appear after habitual tippling, without intoxication having once been produced. The use of intoxicating liquors, and the neglect of sufficient food; a protracted debauch, followed by sudden privation, or by depressing causes; large or repeated depletions employed to remove the headaches or stupor of drunkards, or the first species of this delirium; the treatment indicated by the diseases with which such persons may be affected; the debility caused by the diarrhoea or cholera sometimes consequent on intemperance; the shock arising out of severe injuries, particularly fractures; exposure to cold, a course of mercury, and the puerperal state*; are principally concerned in the production of this affection. That the delirium which has been called "*D. Traumaticum*" by British writers, and "*D. Nervosum*" by DUPUYTREN, is in every respect the same as that now being considered, is proved by the fact of its appearance chiefly in persons of intemperate habits, by identity of phenomena, and by the effects of various modes of treatment upon both being alike.

10. Although the chief cause of delirium tremens is evidently the abuse of intoxicating, especially spirituous, liquors, yet this is not the only cause. It may also be occasioned by the drugged beverages prepared in Eastern countries, particularly in the East Indies, when too freely indulged in; and by the excessive use of opium. But it is chiefly when sobriety has followed a protracted debauch; and when, during the first days of the abstraction of the accustomed stimulus, the additional causes mentioned above, come in aid of the efficient cause,—when the habits and indulgences of the patient have produced that state of the nervous system which readily passes into serious disease upon its being influenced by depressing agents; that true delirium tremens takes place. Inattention to this fact, by nearly all the writers on the disease, excepting Dr. BLAKE, has led to serious misapprehensions. Practitioners have too generally concluded that the delirium of drunkards is always of the same kind; and have overlooked differences very generally subsisting between that immediately produced by intoxication—the *first* species of this affection; and that indirectly occasioned by it—the *second* species, or true delirium tremens. An occasional, or even a single indulgence in intoxicating liquors to excess will sometimes give rise to the former; a repeated, habitual, or protracted indulgence is requisite to the appearance of the latter. The frequency of this affection, particularly in the lower classes, justifies the attention recently paid to it; and I believe that it is more common now than formerly, owing to the cheapness, and facilities of procuring spirituous liquors. Between 1820 and 1832, I treated 21 cases, about two-thirds of which were in consult-

ation with Mr. HOULTON, Mr. BARNWELL, Mr. WINSTONE, Dr. RIDING, and Mr. PAINTER; the others in dispensary and private practice. In some manufacturing and trading towns, it is of frequent occurrence. In the United States of America, it is, however, much more common than in this country. Dr. S. JACKSON states, that he has treated upwards of 200 cases; Dr. CARTER, of Philadelphia, mentions nearly the same number; Dr. WARE says, that he has seen more than 100; and Dr. WAIGHT, that he has received, in the institution at Baltimore, from 60 to 70 cases annually. But it is evident, from the details they have furnished, in the works referred to at the end of this article, that they have included under the same head delirious affections immediately consequent upon intoxication; and that, owing to this circumstance, has arisen much of the contrariety of opinion respecting the nature and treatment of the disease, which is as remarkable amongst physicians on the other, as on this side of the Atlantic.

11. III. SYMPTOMS.—The phenomena of delirium tremens vary remarkably, from the slightest forms of nervous tremor with spectral illusions, and accelerated pulse, to the most alarming state of vital depression, muscular agitation, and mental alienation about to be noticed. Dr. BLAKE has marked out three stages into which the disease may with propriety be divided. It should, however, be recollected, that they are not always obvious or clearly defined; that they exist only in those cases which supervene on the abstraction of the intoxicating stimulus; that the first stage is wanting in those that more immediately follow intoxication, and consequently in most, if not all, the *first* species here described, and that, in the species now being considered, it is but seldom brought under the cognizance of the physician,—medical aid being seldom required until the second period is developed. As the treatment may be more precisely stated when the disease admits of a division into stages, I shall adopt that suggested by Dr. BLAKE, and which differs but little from that which has been followed by Dr. LYON, Dr. RYAN, and Dr. BISHAUSEN.

12. The *first* stage of true delirium tremens frequently appears from two to eight or nine days after a protracted debauch, or a prolonged fit of intoxication; and is commonly attended by slight febrile action, and gastric derangement, often aggravated by some accidental cause, external injury, or contingent ailment (§ 9.), generally the immediate effect of excesses; but the length of time which elapses between the abstraction of the accustomed stimulus, and the commencement of the symptoms, is often uncertain. The first indications of the disease are, according to Dr. BLAKE, a peculiar slowness of the pulse, coldness and clamminess of the hands and feet, general debility, and diminution of the animal temperature. In addition to these, nausea and occasional vomiting, particularly in the morning; much diminution of appetite, and aversion from animal food; excessive perspiration from trivial exertion; frightful dreams; vertigo, and sometimes cramps of the extremities, are complained of. The bowels are often constipated, but sometimes open, or even relaxed, and the tongue is tremulous, furred, and moist. In

* I have seen three cases in females, and these were habitual drunkards: the disease appeared in two of them a few days after delivery.

first species (the *encephalitis tremefaciens*) of this kind of delirium, by its coming on a short time after a protracted intoxication, instead of immediately upon it; by its being caused *indirectly*, instead of *directly*, by the abuse of intoxicating liquors; and by the pulse being stronger and fuller, the head hotter, the face more flushed, the surface of the trunk warmer, the delirium more violent, and the patient more irritable, the tongue drier and redder, and the vascular excitement comparatively greater and more sthenic, in the *first* species (§3.), than in the *second*; although occasionally a few cases of the latter approach these characters of the former. — (b) The same differences, but in greater degree, exist between delirium tremens and *phrenitis*, in which are wanting the cold, copious, clammy, and peculiar perspiration, the soft pulse, and the moist tremulous tongue and hands. The impatience of light, and fulness of the vessels of the eyes, which accompany the latter, are not present in the former. The illusions, also, of delirium tremens are peculiar, and are accompanied with an anxious, fearful, and constant reference to concerns which had previously interested the patient in a particular manner. He can recognise his friends, and return a rational answer to some questions; and he is more tractable and manageable, when not irritated or opposed, than in *phrenitis*. — (c) This affection may be readily distinguished from the *delirium of fever* or *typhus*, by the history of the case — it being the primary and the most prominent ailment; delirium generally supervening late in fever. In this disease, the patient is quick in his movements; is agitated and talkative; is desirous to be up; walks about, when permitted, in a hurried manner; is anxious to follow his occupation, or to avoid, or to find out, or to chase away, some spectral illusion that haunts him; and is violent when opposed: in the delirium of fever, the patient is prostrate, his countenance less wild, his delirium is lower and quieter, and seldom attended by attempts to get out of bed, &c. (See DELIRIUM, §3. 7. 10.) In the former, there is a marked tremor of the hands, &c. from the beginning, and the patient in the last stage seems to search after objects which he thinks he sees creeping over his bed, or floating before him: in the latter, the peculiar tremors are wanting; but there are subsultus tendinum, and picking at the bedclothes, or floccitation. — (d) From *maniacal insanity* it is to be distinguished chiefly, as stated above (b), by the great frequency and softness of pulse; by the copious, cold, and peculiar perspiration; the tremulousness; by the history of the case, — this being an acute, the other a chronic malady. When, however, it occurs in the puerperal state, in which I have seen it, the difficulty of distinguishing it from the mania sometimes supervening at that period may be considerable: the tremors, the greater frequency of pulse, and more copious and colder perspirations, will point out the nature of the affection, and will lead the physician to treat it according as the symptoms indicate a greater or less predominance of nervous exhaustion over vascular excitement.

17. V. PROGNOSIS. — A first attack, in a constitution not yet much injured by the cause of the disease, generally terminates favourably. I have seen even a third attack end so; but its

more frequent recurrence, particularly if it be attended by signs of vascular irritation or erethism of the encephalon (§5. 15.), or by dryness of the tongue, and its complication with some other disease, are circumstances indicating great danger. A want of correspondence in the pupils, and the supervention of subsultus tendinum or convulsions, or of low and muttering delirium, the pulse becoming quicker and smaller, are generally fatal signs. It is also more dangerous when caused by opium, than when proceeding from intoxication. On the other hand, a general mitigation of the symptoms, less frequency of pulse, with quiet or sound sleep, are indications of a favourable termination being at hand. In all cases, however, a cautious prognosis should be given, particularly in broken down constitutions; for success may elude our best efforts, even when most anticipated; and recovery may take place in the most apparently desperate circumstances.

18. VI. PATHOLOGY. — A. The appearances at dissection have furnished only negative information as to the nature of the disease. In the true delirium tremens, the membranes of the brain evince but little change; the chief lesion consisting of slight opacity of the arachnoid, especially at the base of the brain and vicinity. The pia mater is somewhat injected, and a slight effusion of serum is occasionally observed in the ventricles. These appearances are, however, not constant; but they are more marked, and more manifestly inflammatory, in those cases which have accompanied or directly followed intoxication (§3.). In these, the vessels are often much congested, particularly those of the velum interpositum, the arachnoid thickened, and the serum more abundant, and occasionally even sanguineous. The stomach generally presents appearances of chronic gastritis, the villous membrane being either thickened or softened, or both, and the villi effaced. The liver is variously diseased, — often enlarged, granulated, of a yellow or fawn colour, or presenting the fatty degeneration. The lesions, however, of the stomach and liver, are coincidences only, or changes contingent on the habits of the patient, and not necessarily connected with the pathology of this disease.

19. B. The nature of this disease has been a subject of much discussion with modern writers, in consequence of no clear distinction having been made between that form of delirium with tremor, which is the result of vital, and particularly nervous, exhaustion; and that which depends chiefly upon excited circulation, vascular erethism, or inflammatory action, within the head. Although numerous instances will present themselves in which the former as well as the latter pathological state exists, the one, however, predominating over the other; yet the fact of either being present almost solely, if not altogether so, perhaps, in a still greater number of cases, should not be overlooked, as it has been fully demonstrated, both by the post mortem appearances, and by the juvenis and lædantia during life. It is most probably a consequence of having noted the changes observed principally in the *first* species, or in some instances of the *second* as approach it the near. that Dr. CLUTTERBUCK and Dr. BAYLY have viewed this latter as the consequence of inflammatory action in the arachnoid and pia mater.

propriety of prescribing cathartics, in order to remove accumulated secretions. From the quantity of very dark, offensive, bilious evacuations which they have procured,—often not until after their repeated exhibition, and even in cases where the bowels had been opened or relaxed,—I have concluded that collections of vitiated bile in the gall-bladder and hepatic ducts have favoured the supervention of this peculiar affection. Under this conviction, I have always exhibited, as early as circumstances would permit, an active chologogue purgative, generally a bolus consisting of about ten grains of calomel, with as much camphor, and a grain of opium, in conserve of roses; and, in a few hours afterwards, a warm stomachic and aperient draught, followed in an hour or two by an enema (F. 135.). The advantages arising from conjoining camphor, or large doses of ammonia, or capsicum, or other stimulants, with purgatives in this disease, are manifest; for, by these or similar means, we shall succeed either in arresting its progress, or in preventing the depression which might follow copious evacuations—fears of which have paralysed the treatment of it. In all cases, but especially in diseases accompanied by low or melancholic delirium, accumulations of vitiated bile or other secretions should be suspected and be removed: nor should we infer, from having at first failed in procuring their discharge, that no such disorder exists; for the most active, and even the most judiciously selected, cathartics may long fail in evacuating the thickened and morbid contents of the gall-bladder and hepatic ducts, particularly when their excitability has become exhausted by spirituous potations.

25. *b.* In the *second stage*—if it supervene notwithstanding the above means, or if the patient be not seen until it has appeared—the treatment should be commenced by the exhibition of the calomel, camphor, &c., as prescribed above (§ 24.), if they have not been already exhibited, or if they have not procured copious, dark, and offensive stools; and evacuations ought to be promoted by warm and stimulating aperient draughts, and by purgative enemata containing assafoetida, camphor, &c., or consisting of F. 130. 149. The greater number of the cases I have seen had been treated by able practitioners, according to the plan advised by the best writers, but without success—although purgatives had been given where the bowels had not been sufficiently open. In all these, this treatment was immediately put in practice, and assisted by cordial draughts containing some one of the ammoniated spirits, and æthers, &c., and by the enemata already alluded to. As soon as alvine evacuations were procured by these means, opium, either alone, or with ammonia or camphor, or with both, was prescribed in full doses, and repeated according to its effects; and although they were all severe cases, one only terminated fatally.

26. At this period of the disease, the *warm bath*, at a temperature of about 90°, will assist materially in tranquillising the patient, and promoting the effects of opium. Dr. WRIGHT, of Baltimore, strongly recommends it; but it is not a new practice in delirium tremens, as he supposes; and he is favourable to the use of Dover's powder, which, however, is more suitable to the

preceding species. Although opium should be given in full or decided doses, combined as stated above,—(in from one to three or four grains—the smaller quantity being repeated twice or three, the larger not oftener than once, and after a longer interval),—it should not be persisted in, unless sufficient time be allowed to elapse after each dose; for, as Dr. PEARSON has observed, if it does not succeed after its exhibition at first in a decided manner, it increases the intellectual confusion and danger. Some of the American physicians have recommended enormous doses of this medicine. Dr. S. BROWN gives from ʒj. to ʒss., or even more, of laudanum for a dose. Dr. S. JACKSON prescribes from ten to fifteen or even twenty grains of solid opium every two hours, and states, that four ounces of good laudanum, having been given in twelve hours, partly by mistake, a sound sleep of twenty-four hours' duration, and perfect recovery, were the result. I only am surprised that the sleep was not that of death. These are not solitary instances of the extravagance, if not rashness, of some American practitioners; nor, indeed, has the practice of giving excessive doses of laudanum in this affection been limited to them. When we find thirty or forty leeches ordered to be applied to the throat of a child five or six years old in croup, and repeated oftener even than once, and the bleeding promoted, should we wonder that death ensues? Feats of hardihood in medicine are too often the consequence of clerical and practical ignorance; and they may be allowed to meet their own reward, as long as they are not obtruded into the annals of our science, and thereby set forth to the inexperienced as examples to be followed. But when this distinction is conferred on them, it becomes the duty of those who record the progress of medicine, to note also, and to oppose, its backslidings by the severest reprehensions.

27. I believe that large and frequently repeated doses of opium in this disease, as Dr. WRIGHT, of Baltimore, has remarked, favour the supervention of coma, convulsions, or paralysis, and that the effects of an excessive quantity of this drug very nearly resemble the phenomena of the last stage of the disease, particularly towards its fatal close. This fact should not be overlooked, and should lead us to distinguish between the consequences of an injudicious treatment, and the worst features of the malady. It is the abuse of opium that is here argued against; not truly medicinal exhibition that is contended for,—given in a quantity which sound sense will direct, and after accumulated and morbid secretions and excretions have been removed, the discharge of which might be impeded, or interfered with, by the immediate employment of this valuable remedy. I consider opium as necessary to the cure of this disease, as bark and analogous medicines are to the cure of ague; but, as in their case, the morbid colluvies, which has at least disposed the system to be affected, and aggravated the malady, should be removed, in order that recovery may be ensured and be permanent.

28. In this stage of the disease, particularly when the delirium is attended by much agitation or violence, it is necessary to obtain an influence over the patient's mind by moral means. All irritating contentions, however, should be avoided.

and the patient's wishes, when not likely to prove injurious to him, be indulged. By thus granting what is less material, he will more readily submit to what is important; but he ought not to be left a moment without an attendant. Coercive measures will generally be found unnecessary, if soothing and indulgent but firm treatment be adopted, and the warm bath be occasionally resorted to. In a majority of instances, the above means will be followed by a remission of the symptoms, and a disposition to sleep will manifest itself,—sometimes, however, accompanied by nervous rigors. Opium should now be left off, or its dose much diminished; and the patient kept as quiet as possible. His first slumbers are often short, broken or interrupted by startings, or terminated by fright. If he awaken alarmed, his distress should be soothed, and a moderate dose of opium with warm spiced negus or punch may be given him; these will generally secure a sound sleep, from which he will awaken in a rational state of mind. Afterwards it will only be necessary to support the strength by light and nutritious diet, and gradually diminish the quantities of the restoratives that have been prescribed.

29. In cases characterised by much vital depression, very frequent pulse and cold surface occurring in old and habitual drunkards and broken constitutions, a liberal use of cordials, and even a moderate quantity of the accustomed stimulus, in addition to the opium, should be administered from time to time; particularly if the head be cool, the face pale, and the action of the carotids not strong. On the other hand, in those cases which were described (§ 15.) as approaching the first species of the disease, cupping, or the application of leeches on the occiput, or nape of the neck, or behind the ears, will be requisite early in this stage; and full doses of calomel, and the rest of the *purgative* treatment, with cold applications, or tepid affusions on the head, should be more actively employed, and precede the exhibition of opium. In this state of the disease, opium often aggravates the symptoms, unless it follow a judicious use of these remedies; and other excitants are equally injurious. In these cases, James's powder, or antimony, either previously to, or conjoined with, camphor and opium, will also be productive of much benefit.

30. That state of the disease which comes on after external injuries or operations (§ 9.), I have imputed chiefly to the previously intemperate habits of the patient. It requires the same treatment as the more nervous or vitally depressed cases now alluded to (§ 29.); and, as well as these, will be remarkably benefited by small clysters containing moderate doses of laudanum, administered after the bowels have been sufficiently evacuated, and repeated according to circumstances. This treatment has been much relied upon by M. DUPUYTREN; but if it remove not the disorder, after sufficient time has been allowed for its operation, camphor may be added to it; and ammonia, musk, æther, &c. be given in suitable vehicles; or a moderate quantity of the patient's favourite beverage allowed him, as suggested by Dr. COLLES. Of two cases recently reported (*Med. Gazette*, vol. vii. p. 287.), which confirm the view I have taken of the origin of

traumatic delirium in that state of constitution which intemperance induces, opium failed in one; and *hydrocyanic acid*, which was tried in the other, was equally unsuccessful.

31. c. If the *third stage* appear notwithstanding the above treatment, little hope of recovery can be entertained, as most likely serous effusion has become superadded to exhausted vital and nervous influence. Nevertheless, medical aid should not be withheld, especially if the patient have not received it in the earlier periods, or have been treated injudiciously. The hair should be removed from the head, and either a blister applied, or one of the liniments (F.299. 308.) rubbed upon it. A blister, sinapism, or other rubefacient, should also be applied over the epigastrium; and camphor, ammonia, musk, capsicum, &c. liberally administered; restoratives and stimulants being also exhibited in clysters. Mercurial liniments containing camphor may likewise be rubbed upon the inside of the thighs, and the warm bath resorted to.

32. d. Certain *modes of practice* have been employed, to which a brief reference may be made. Dr. KLAPP, and some other physicians of the United States, have recommended *tartar emetic* in frequent doses, until it nauseates and purges the patient; but this treatment is more appropriate in the first species, or in such cases of the second as approach it most nearly (§ 15.) Dr. SPERANZA, of Parma (*Bullet. des Scien. Méd.* Sept. 1830.), directs leeches to the head and anus, applies ice to the scalp, and gives calomel and jalap, and subsequently *hydrocyanic acid*. This method is obviously suited only to the first species, and would be injurious in most instances of the second. From the preference he has given to the appellation adopted by J. FRANK,—*Encephalis tremefaciens*,—I would infer that he has never prescribed it in the true delirium tremens. Dr. A. L. PIERSON (*N. Eng. Journ. of Med. and Surg.* vol. ix. No. 2. Ap. 1820.) states, that he gave very large doses of *digitalis* (sixty drops every three hours) after bleeding, and the patient recovered; but this was evidently a case of this first form of the disease. Dr. PAULI informs us that he has prescribed from three to six drachms of fresh ox-gall, in aromatic water, half a glass of brandy each morning, and two grains of the watery extract of opium at night, in forty-three cases, and has lost only one (*Med. Gazette*, vol. ix. p. 776.). The propriety of having recourse to moderate quantities of the stimulus to which the patient has habituated himself, in the depressed periods of the disease, and especially in those cases which present the more marked signs of exhausted nervous and vital power, has been insisted on by Dr. BLAKE, Dr. RYAN, &c., and admitted above, as well as by others; and quinine, capsicum, the preparations of hop, and various aromatics and cordials, may be also used as adjuvants of opium.

33. e. During the treatment, little or no *nourishment* is desired, or even required: arrow-root and sago, with a little brandy or white wine, may however, be given from time to time, particularly if the patient wish it. When he becomes convalescent, the diet should be very light, but nutritious; and a suitable beverage, in moderate quantity, be allowed. During recovery, the state of the digestive functions ought to be attended

to, and promoted by tonics, and by aperients whenever the bowels are torpid. I have never known or heard of an instance wherein the state from which the patient has escaped, or the representations of the medical attendant or friends, has effected a reformation of the habits which produced the disease. However, the physician should discharge his duty, by stating to him the consequences that will accrue from persisting in them.

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DENTITION, DIFFICULT. — SYN. *Dentitio difficilis*, *Odontio Dentitionis*, Good. *Dysodontiasis*, Ploucquet. *Difficult Teething*.

CLASSIF. — I. Class, 1. Order (Good).

II. CLASS, I. ORDER (Author).

1. DEFIN. — *Slow or delayed evolution of the teeth, with signs of local irritation, and constitutional disturbance, often with disorder manifested especially in the digestive organs and nervous systems, occurring chiefly in weak or over-fed children.*

2. A general view of the pathological relations of dentition was exhibited in the article AGE (§ 10.); and, therefore, only that morbid condition of the process which is unattended by disease of an important organ, and is referrible chiefly to this process itself, although often causing disease, or being accidentally associated with it, will be here noticed.

3. i. Dentition, in the most favourable cases, is preceded by slight salivation, by heat and fulness of the gums, occasional flushings, increased thirst, restlessness or fretfulness, and frequent endeavours to thrust things into the mouth, evidently to allay irritation or itching. These symptoms generally appear about the third or fourth month, and precede the appearance of the teeth sometimes by several weeks; and occasionally subside, and reappear shortly before the tooth makes its way through the surface. These signs of disturbance are merely the necessary attendants on the formative processes going on in the gum. But very commonly in children of deficient vital power, and occasionally in those which are apparently robust, or rather plethoric from overfeeding, dentition is either delayed, or is attended by more serious disorder, particularly while the canine teeth are being protruded. In delicate children, particularly those living in crowded towns, and low and ill-ventilated localities, this process is

both late and slow in taking place, and is often attended by signs of increased irritation, as redness or tumefaction of the gums; by various cutaneous eruptions; by greater fretfulness, sometimes sickness and feverishness towards night, with restlessness, fits of crying, and sudden startings from sleep. These may be the only ailments, which may subside either partially or altogether as soon as the tooth has passed the surface, and return shortly before others come in sight; but not infrequently, particularly in this class of patients, disorders of the prima via, particularly chronic diarrhoea, slight dysenteric affections, or slow remitting forms of fever, obstruction or enlargement of the mesenteric glands, obstinate and recurring coughs, tubercular degeneration in the lungs or digestive tube, marasmus, &c., supervene more or less rapidly.

4. ii. In children who are of a plethoric rather than of a robust habit of body, and which Dr. J. CLARKE has, with much justice, ascribed to over-feeding, the gums are often swollen and painful, the face flushed, the head hot and pained; and all the symptoms of inflammation of the membranes of the brain, or of inflammatory fever with determination to the encephalon, frequently supervene. In them, the symptomatic fever is generally high, and attended by great thirst, nausea, vomitings, constipation, and occasionally by drowsiness or stupor, or by great irritability and restlessness, or by both states of disorder alternately; sometimes by short broken slumbers, from which the child awakens in a state of alarm, or in a fit of crying; or by convulsions, diminished secretion of urine, and other signs of cerebral affection. These are the usual concomitants and symptoms, or consequences, of difficult dentition; but they do not always stop here; for they often run on into more serious disease, — such disease, however, occasionally appearing more abruptly and without these precursory ailments, at least in such degree or duration, as to become objects of attention to the attendants, or to lead them to resort to medical aid. These maladies, although often occasioned either partly or chiefly by dentition, when occurring in children at that epoch; and whether affecting the cerebral, the thoracic, or the abdominal organs, or the skin; are still more frequently independent of this process, and therefore cannot be further alluded to in connection with it, than they have already been in another place (see AGE, § 10.); — and; indeed, in most instances in which a close connection between them and difficult or morbid dentition is observed, it is that of concurrent effects of constitutional predisposition and of anterior changes in the organic functions; the local irritation and sympathetic febrile disturbance either exciting morbid action in such organs or tissues as, from hereditary conformation or vice, are disposed to it; or aggravating previously existing disorder, and rendering evident what was before latent, or unobserved. In these cases, therefore, dentition is to be looked upon either as a principal, or as a concurrent exciting cause of many of those diseases which occur at the period of dentition — but a case most frequently concurrent with improper feeding and clothing.

5. iii. A natural or slightly difficult dentition may be converted into serious disease, by the not

uncommon habit of giving the infant food whenever it cries from the irritation attending upon the process, and thereby overloading and further disordering the digestive processes, which are already disordered by the febrile disturbance generally accompanying it; whilst determination of the circulation to the head is favoured by the practice of covering the head in-doors or when asleep, and by wearing thick felt hats during mild or warm weather. BRANDIS believes that difficult dentition is the consequence of obstruction of the salivation which accompanies, and is salutary in, this process: HECKER, that it results from a morbid state of this secretion: MYLIUS, that it is the effect of disorder sympathetically induced in the liver: THOM, that dentition often occasions an acrimony of the abdominal secretions, which react upon the original seat of disorder, and upon the system generally; thereby rendering it difficult or morbid: WIGAND, that the affections attending, delaying, and otherwise disordering, this process, are accidental complications merely; and JOHN CLARKE, that all such disorders are commonly the consequences of plethora arising from over-feeding. Now, in all these opinions, there is much truth; and one or other, or several of them obtain in many instances, more, however, as contingent and related effects of the local irritation, than as causes of the difficulty of the process,—which irritation is the chief or concurrent cause of febrile disturbance, of disordered function, and at last of more palpable disease, according to the condition of particular organs at the time, and constitutional or acquired predisposition.

6. iv. The *irruption* of the *second* or permanent teeth may also be delayed or attended by sympathetic disorders, particularly in persons whose *maxilla* are insufficiently developed, and when the *dentes sapientes*, and the canine teeth, are appearing. In delicate, nervous, and irritable subjects, swelling of the parotid and sub-maxillary glands, painful and sometimes periodic affections of the ear or face, slight or recurring ophthalmia, irregular convulsions, or epilepsy, and chorea, have, in some instances, been excited by this cause; and have disappeared upon the eruption of the teeth, or the removal of the local irritation.

7. v. The TREATMENT of difficult dentition should be directed with the intention—1st, of removing the local irritation; and, 2d, of subduing the sympathetic disorders associated with it.—A. The local irritation requires scarification of the gums whenever they are at all swollen or red; and particularly in the second stage of the process, when the tooth has reached the surface, whether there be redness and swelling, or not. The propriety of this operation has been, however, called in question, particularly by STERNBERG, STORCH, THOM, and BRANDIS, on the plea of its inutility, of it occasioning ulceration or disease of the capsules of the teeth, and of the cicatrix which is soon afterwards formed being absorbed with greater difficulty than the other parts. But these are by no means valid objections—for its utility has been proved by the experience of HARRIS, COWPER (*Anat. of the Hum. Body, &c.*), BROMFIELD (*Observations, &c.* vol. ii. p. 17.), BERDMORE (*Treatise on the Teeth, &c.* 8vo. Lond. 1770.), HURLOCK, RIEDLIN, WEDEKIND, KENNEDY, MARLEY, myself, and most modern writers of experience: and, as to the contingent ulceration of the gums, it seldom or

never occurs when the operation is judiciously performed; when the lancet is clean, not carried too deep into the gum, if lancing be performed early in the process; and when its edge is directed rather outwards, as recommended by Mr. MARLEY. That the cicatrix may oppose the passage of the tooth is certainly not proved; but this, if it did, is no objection, as a repetition of the operation, is often necessary, and generally beneficial. M. BROUZET (*Sur l'Educat. Médic. des Enfants*, t. i. p. 234.) advises the surface of the gum to be divided, from time to time, by the point of the nail,—a practice which possesses the advantage of not alarming the child, of being easily and readily performed, and of delaying the closing of the divided part. But care should be taken not to perform it until the nails have been well cleaned.

8. The propriety of allowing the infant to rub the gums with hard substances has been questioned by AUZENI, MARLEY, and others, from an idea that they will hereby become more callous, and absorbed with greater difficulty. But the truth of this is questionable. I believe that substances pressed frequently between the gums, materially lessen the irritation and distressing itching felt in them, and promote the flow of saliva,—results of no mean importance in preventing the supervention of sympathetic disturbance. These results will be ensured, in cases of existing irritation, by frequently moistening whatever substance is thus employed with biborate of soda mixed in a little syrup of senna.

9. Besides the above, various other means have been recommended in order to subdue the local irritation: the chief of these are—a preservation of a lax state of the secretions and bowels; leeches, particularly behind the ears (SYDENHAM, KORTUM, STOLL, LEROY, *Journ. de Paris*, 1784.); internal emollients (PAULUS ÆGINATUS, l. i. cap. 9., and BEKKER, *Hermet. Rediviv.* p. 705.); various derivatives (HUFELAND); calomel (MYLIUS and others); the alkalies (HECKER); cold applied to the face (WIGAND); opium (WEDEKIND); and active purging (VANDERMONDE and PORTAL, *Anat. Médicale*, t. i. p. 211.). The best means of promoting the secretions and alvine evacuations are, small doses of hydrarg. cum creta, conjoined with the dried carbonate of soda, and, if the state of the bowels requires it, with the pulv. jalapæ, given every night. Leeches behind the ears, and cold applied to the head, should never be neglected whenever the temperature of this part is increased, and other signs of determination of the circulation to it are observed. In such cases active cathartics, calomel with James's powder, and the rest of the treatment recommended for cerebral diseases, are necessary. Blisters applied also behind the ears are the best external derivatives; but they should be removed as soon as redness is produced. Opium is very seldom admissible; but, if much irritation exist, the tepid bath, and syrup of poppies with small doses of the biborate or the carbonate of soda, may be prescribed. If the gums become ulcerated, biborate of soda or sulphate of alumina, or the boracic acid, in honey or syrup of roses, should be employed.

10. B. The *sympathetic disorders* should be subdued as soon as they appear.—(a) If the head indicate vascular excitement, the means already specified (§ 6. 8.) should be directed; and if

CELSEUS. ANETAEUS gave a tolerably complete history of it, which the majority of his followers merely copied. ALEXANDER of TRALLES added nothing to either its pathology or treatment, excepting the drawing of a comparison between it and lientery; and AËRIUS, taking up the same idea, states, that the one affection differs from the other in as far as that the undigested aliments pass off, in the former by the urine, in the latter by the stools; an opinion which was afterwards adopted by FERNEL, DURET, ZACUTUS-LUSITANUS, and others. But WILLIS was the first who advanced a rational theory of the disease. Since his time, opinions as to its pathology have been various, and the remedies recommended still more diversified.

3. Even up to the present day, the term *diabetes* has been applied to various states of disease:—1st. To that consisting chiefly of *diuresis*, or morbidly increased flow of urine, without reference to its quality; 2d. To that in which the urine is voided not only more frequently, and in larger quantity than natural, but also of changed quality, as respects certain of its constituents, viz. albumen and urea, either of which may be in excess; and, 3d, to that in which a saccharine matter is either superadded to the other ingredients contained in the urine, or in part replaces them. To the last of these morbid states I shall limit the term *diabetes*, conformably with the views of Dr. PROUT and M. RENAULDIN. The other morbid conditions of the urine will be noticed when treating of the pathology of this secretion. (See URINE.) Restricting, therefore, the term *diabetes* to that state of the urine characterised by the presence of saccharine matter, I have defined it accordingly. In consequence of the very vague ideas which have but too generally been entertained both as to the phenomena requisite to constitute this malady, and as to its various morbid relations, diabetes has generally been considered with reference to the quantity of the fluid secreted, without regard to the circumstance alluded to by Dr. PARR and others, and judiciously insisted on by Dr. PROUT, that the disease may exist for a long time, and the urine be extremely saccharine, without much, or even any, increase of its quantity; and, when the urinary discharge is augmented much beyond natural, that it is much easier to reduce it even to the usual quantity, than to restore it altogether to its natural quality.

4. I. SYMPTOMS.—A. The urine of diabetic patients is generally of a pale straw or greenish yellow colour; of a faint and peculiar odour, sometimes resembling that of hay or of sweet whey or milk, or of violets. Its taste is always more or less saccharine; and its specific gravity usually varies from 1.025 to 1.052. The quantity of urea is seldom much diminished in diabetic urine: Dr. PROUT and Dr. HENRY have never observed it altogether absent; and Mr. KANE and Mr. M'GEEON have found it in greater relative proportion than in healthy urine, but masked by the sugar or saccharine matter held in solution: there is little or no lithic acid. The usual saline ingredients in healthy urine exist in the urine of diabetes, but in diminished quantity, whilst their relative proportions continue nearly the same. Dr. WATT has found a little blood in it; but this is a rare occurrence: it much more frequently contains albuminous matter analogous to that of

chyle. Dr. HENRY has given a useful table, showing the quantity of solid extract in a wine pint of urine of different specific gravities from 1.020 to 1.050. The following abstract of this table will enable the reader to ascertain the quantity of solid matter diabetic urine may contain:—

Specific gravity compared with 1000 parts of water at 60°.	Quantity of solid extract in a wine pint.	Quantity of solid extract in a wine pint, in
	grains.	oz. dr. scr. gra.
1020	382.4	0 6 1 2
1021	401.6	0 6 2 1
1022	420.8	0 7 0 0
1023	440.0	0 7 1 0
1024	459.2	0 7 1 19
1025	478.4	0 7 2 18
1026	497.6	1 0 0 17
1027	516.8	1 0 1 16
1028	536.0	1 0 2 16
1029	555.2	1 1 0 15
1030	574.4	1 1 1 14
1031	593.6	1 1 2 13
1032	612.8	1 2 0 12
1033	632.0	1 2 1 12
1034	651.2	1 2 2 11
1035	670.4	1 3 0 10
1036	689.6	1 3 1 9
1037	708.8	1 3 2 8
1038	728.0	1 4 0 8
1039	747.2	1 4 1 7
1040	766.4	1 4 2 6
1041	785.6	1 5 0 5
1042	804.8	1 5 1 4
1043	824.0	1 5 2 3
1044	843.2	1 6 0 3
1045	862.4	1 6 1 2
1046	881.6	1 6 2 1
1047	900.8	1 7 0 0
1048	920.0	1 7 1 0
1049	939.2	1 7 1 19
1050	958.4	1 7 2 18

This table enables us to ascertain with considerable precision the quantity of solid matter voided by a diabetic patient in a given time. Thus, suppose 10 pints are passed in 24 hours, of the average specific gravity 1.040, it is evident that this will contain $10 \times 1.4 \dots 2 \dots 6 = 15 \dots 7 \dots 2$, or upwards of a pound and a quarter of solid extract. Diabetic urine, in a moderate temperature, becomes sour, smells like turned milk, and sometimes ferments. With the addition of a little yeast, it readily undergoes the vinous fermentation, yielding alcohol by distillation, the quantity of which indicates the amount of saccharine matter in the urine.

5. Besides the *saccharine* condition of the urine, the next most striking and constant symptom is its *increased* quantity. Sometimes the quantity voided is enormous. P. FRANK details a case in which 52 lbs. were passed in twenty-four hours; and instances are by no means uncommon of from twenty-five to thirty-five pints having been discharged in the same time for weeks, or even months together. In some cases the urine has been said to have been nearly double the quantity of the whole ingesta,—a circumstance which has puzzled physiologists to explain, and has induced some to believe that, in addition to the colligation of the solids of the body, absorption of moisture from the air actually takes place during the disease in some cases, either through the medium of the respiratory organs or cutaneous surface, or both. I believe, however, that so great a difference between the quantity of the ingesta and urine, as here stated, is extremely rare; although a considerable excess has been proved by Dr. BARDSLEY; and the experiments of modern physiologists have shown that the

vious health of the patient, the nature of the exciting cause, the form of the complication, the diet and regimen prescribed, and the means of cure employed. It is always exasperated during cold and moist weather. FRANK states, that it is also worse in autumn. HECKER, THENARD, DUPUYTREN, and the author, have known it to continue, with intervals of improvement, for many years; and OOSTERDYCK states that he treated a case that terminated unfavourably in a few days. When the issue is fatal, it commonly runs its course in a few months, and is seldom of shorter duration than several weeks. I believe that the disease not infrequently exists, for a considerable time at least, without any very sensible increase of the quantity of the urinary discharge, and that it is hence often far advanced before it comes before the physician; and that many cases which have been believed or stated to have been cured, have experienced merely a temporary benefit, — the malady returning in all its severity from the slightest exposure to its more common exciting causes, or the least want of attention to the requisite diet and regimen.

11. iv. ORGANIC CHANGES are by no means constantly observed after diabetes, even in the urinary organs; and, when present in them, are not such as may account for the disease; but, as HECKER has justly contended, are rather its effects than its causes. RUTHERFORD, HOME, DUPUYTREN, SEGALAS, and DEZEIMERIS, have found the kidneys somewhat enlarged and vascular. BONET, MORGAGNI, MONRO, HERTZOG, CAWLEY, DESAULT, and HECKER, have observed them only more flaccid than natural: and CRUICKSHANKS, REIL, RUTHERFORD, DUNCAN, and BAILLIE, have remarked merely a more turgid state of their blood-vessels; which FRANK and VETTER have stated to have been more lacerable than in the healthy state. In rarer instances, one or even both kidneys have been observed much smaller than usual (P. FRANK, MÜLLER). Hydatids have been found, by BEER, filling and distending them enormously; and calculi have been detected in their pelvis by BAILLOU. RUYSCH and HECKER met with cartilaginous induration of their envelopes and cortical substance; and BRODIE found their structure hard and gristly. MÜLLER mentions enlargement of their nerves; and DUNCAN records a case in which the splanchnic nerves were all enlarged to three or four times their natural size. CONRADI observed the pelvis of the kidneys enlarged so as to contain a small orange; and RUYSCH, RUTHERFORD, REIL, HECKER, and CLARKE, remarked considerable dilatation of the ureters. Increased size of either the pelvis of the kidneys, or of the ureters, or urinary bladder, or even of them all, is not infrequent. In some instances, the bladder is thickened, or contracted, and slightly inflamed, and the prostate enlarged. All the urinary organs, however, have been found as frequently natural, even by the authors now mentioned, as presenting the above changes.

12. Next in frequency to enlargement and flaccidity of the kidneys, the mesenteric glands have presented morbid appearances. MASCAGNI, JUNCKER, HIMLY, REIL, HOME, CAWLEY, and HECKER, have found them enlarged, obstructed, and otherwise changed; but they also have been met with perfectly natural, by the same authors, as well as by others. RUTHERFORD and MONRO

have observed enlargement, softening, and increased vascularity of the absorbent glands generally. The thoracic duct has, in a few instances, been found greatly enlarged and dilated. The lungs are, perhaps, as frequently diseased as any other organ. I have never seen a case examined in which they were perfectly healthy. LUNOTH, SEGALAS, DUPUYTREN, and HORN, have severally observed tubercles in every stage of their progress; ulcerations, tubercular excavations, hepatisations, and purulent collections or disseminated vomices, in the lungs, as well as inflammation of the pleura, and its consequences — adhesions of the pleura, &c., of the pericardium and pleura, serous effusion into the pleural cavity, &c. M. LUNOTH detected, in addition to hepatisation of, and excavations in, the lungs, aneurism of the pulmonary artery, the kidneys being sound. Similar states of the pulmonary artery, lungs, and kidneys, were found in a case recorded by M. LOBSTEIN; the lungs being extensively tuberculated, hepatised, and adherent to the thorax, without any manifest thoracic symptoms during life. The digestive organs have been next most frequently diseased. DUPUYTREN and SEGALAS have observed a more vascular state than natural of the digestive mucous surface, but without any organic change of the stomach, or intestines, beyond dilatation of the former, and of the duodenum. RUTHERFORD and BAILLIE always found the stomach healthy. The liver is more frequently diseased. MEAD states that it was always altered in structure; whilst CULLEN, FRANK, and HOME, generally observed it natural. CAWLEY and HECKER have commonly detected organic change of this viscus. The spleen and pancreas have seldom presented any lesion. MICHAËLIS, CONRADI, and HECKER, detected chyle imperfectly mixed with the blood in the large vessels and cavities of the heart; and the same authors, and MARSHALL, remarked a chocolate appearance of the blood in all the vessels. Dr. RUTHERFORD states that the blood was black and fluid in all the cases he inspected. In the cases I have seen examined, the mucous surface of the stomach, and of the upper parts of the small intestines, was rugous and vascular. The lungs were congested or hepatised, or tuberculated and excavated, or their pleuræ adherent. The heart was flaccid, soft, and small; the blood dark and semi-fluid; the kidneys congested with dark blood, and somewhat large; the super-renal capsules somewhat indurated; and the renal ganglia more than usually large. But these changes are not uniformly observed; several of them were wanting; and in one or two instances, no decidedly morbid change was detected, beyond the absence of the usual cadaverous and peculiar odour generally perceived upon opening the cavities. Upon the whole, therefore, *post mortem* research has thrown but little light on the nature of diabetes, further than showing that it is the result of a morbid condition of several, if not all, of the digestive, assimilating, and excreting viscera, and not of any one of them.

13. II. PROGNOSIS and DIAGNOSIS. — A. Although patients whose constitutional powers are not greatly reduced, may sometimes live for many years, under judicious treatment, in this disease, yet should the prognosis be upon the whole very unfavourable: a cure may, however, be effected

by appropriate means adopted early; but this result is comparatively rare, and should never be considered as perfect, unless the healthy quality, as well as quantity, of the urine be altogether recovered, and the strength and bulk of the body be restored. Partial, or even very great, relief is often afforded; but the malady after a while returns, and may proceed without admitting of relief to a fatal issue, or be again and again checked by treatment. Much depends upon the patients themselves, and the strictness with which the prescribed regimen is followed; for, as the disease often originates in excesses, a return to them upon partial, or tolerable, recovery, will bring back the disease. When we find it complicated, as it most commonly is, with organic disease of the lungs, liver, or lymphatic system, a favourable issue cannot be expected. Out of from twelve to fifteen cases I have treated, I know of two only at the present time that have perfectly recovered. One of these, a married woman, who had previously been attended by an eminent writer on the disease, has continued perfectly well for six or seven years; but although not yet thirty-five, the catamenia, which had disappeared before the development of diabetes, has not returned. The chances may, perhaps, be estimated at about five or six, or even higher, against the patient; but much will depend upon the quantity and quality of the urine, the progress of the disease, the age, visceral complications, constitutional powers, the state and functions of the skin, the degree of emaciation, and circumstances and character of the patient. I believe that the prognosis should be much more unfavourable where the urine is mellitic, than when it is not so changed, however abundant it may be.

14. B. The *Diagnosis* of diabetes mellitus is very readily formed from the sensible properties of the urine. (See the *Symptoms*, § 4. ; and art. URINE.)

15. III. CAUSES. — A. *Predisposing*. Hereditary predisposition to this disease has been remarked by several authors. Dr. PROUT has observed it in four instances. ISENFLAMM states that he knew of seven of the descendants of a diabetic patient, who died of the malady. MORTON, BRISBANE, ROLLO, BLUMENBACH, FRANK, STORER, and CLARKE, also furnish similar facts. Diabetes is more frequently met with in the male, than in the female sex; and in persons who either are past the period of puberty, or are advanced in years. The true diabetes mellitus is rare in children, whilst albuminous urine and enuresis are frequent complaints in them. It is much more common in cold and moist countries, particularly those in which the inhabitants live chiefly on rye, or any other vegetable food, or are imperfectly nourished, than in warm or dry climates: and is hence oftener met with in Great Britain, Ireland, Holland, Denmark, and Sweden, than in France and Germany; and in the western, than in the eastern side of this island. J. FRANK states that he saw a greater number of cases of it in Italy, than in any part of Germany. Dr. CHRISTIE observed it more frequently amongst the inhabitants of Ceylon, than in any part of continental India; and imputes it to the moist state of the atmosphere, and their poor vegetable diet. The scrofulous diathesis also predisposes to it.

16. B. The *Exciting Causes* are not so precisely ascertained as the predisposing, and their

connection with the origin of the disease not so obvious as could be desired; but the following, acting either individually or in conjunction, particularly in the latter mode, may be considered as most commonly productive of diabetes, where a predisposition to it exists, either hereditarily, or from visceral disease: — Continued or repeated exposure to cold and moisture; drinking cold fluids when the body is over-heated; suppression of an habitual perspiration, by whatever means; acridulous or fermented liquors, particularly in malt liquors, cyder, &c.; the exhaustion arising from excessive evacuations and morbid discharges, or from undue sexual intercourse; great bodily and mental exertions; the depressing passions, such as anxiety, disappointment, &c.; and whatever occasions great exhaustion of the powers of life, and of assimilation, is sometimes productive of the malady. Besides these, authors have adduced others as its occasional causes. AURELIUS mentions the use of acids and acidulous fluids; BOERHAAVE, LISTER, STEDMAN, and FRANK, the abuse of diuretics and diluents; SYDENHAM and SENAC, excessive horse exercise; RUYSCH, CRUSELDEN, and LATHAM, the existence of chronic abscesses and carbuncles; FRANK, the carrying of heavy weights; BENNEWITZ (*Ossian's Jahresbericht*, &c. July, 1828.) relates the case of a female who was affected by the disease during two successive pregnancies; PLOUCECKY and others have observed it result from falls, and injuries on the back, loins, and hips; and BAILLOT, BRENDL, WEBER, LANZONI, and FRANK, the drying up of chronic eruptions, exanthema, fluor albus, &c., or the suppression of hæmorrhages. It may be suspected, however, of the last named phenomena, that, instead of being causes of the disease, they are actually the effects resulting from the internal changes constituting its early stages — diabetes, or the internal changes leading to it, having commenced previously to the disappearance of the external disorders — for it has been often remarked that sores heal rapidly during the disease. Diabetes may, indeed, be frequently considered a remote effect in the chain of morbid causation; functional or even structural change of the assimilating viscera, particularly the lungs and digestive organs, existing for many months, or even years, before the increase, or the saccharine state, of the urine has attracted attention.

17. C. The *proximate cause* of diabetes is still extremely obscure, although several authors of deserved reputation have endeavoured to explain it. — 1st. It has been ascribed to a morbid condition of the kidneys. This is the oldest opinion that has been entertained respecting its nature. The Greek writers considered diabetes to be owing to relaxation, debility, and increased irritability of these viscera; the irritability being, as they supposed, the cause of their morbid activity; and the relaxation and debility allowing the more liquid parts of the blood to pass through the excretories without restraint or change, and, consequently, in a crude state, like the food in lenteria. The supporters of this doctrine adduce, in proof of it, those morbid changes that have been observed in the kidneys, without agreeing amongst themselves as to the particular changes which really constitute the disease. Some consider that they are essentially inflammatory. But they overlook the facts, that decided and

action. P. FRANK has very materially moulded this hypothesis, and into a more plausible form, by relinquishing the untenable idea of a retrograde action of the absorbents. He conceives that diabetes is a disease of the lymphatic system, conjoined with excitement of the urinary organs; that it proceeds from stimulation of both these by some virus formed within, or introduced from without, and producing a reverse effect to that occasioned by the virus of the rabies canina; so that, while the latter produces a dread of liquids, the former excites a constant desire for them. In support of this doctrine, he adduces the opinion of the ancients, that diabetes is occasioned by the virus of a serpent called *dipsas*, and hence the common name generally given by them to this malady. That it may be excited by the bite of reptiles, or even higher animals, is not impossible. Dr. LATHAM mentions a case produced by the bite of a rat; and it not infrequently arises, as remarked by CHESLDEN and LATHAM, from carbuncles, or chronic abscesses, where it may be presumed that a partial absorption of morbid matter takes place. FRANK supposes that the morbid matter occasioning the disease acts by inducing a morbid irritability of the lymphatic system, owing to which every other part of the frame is exhausted of its nutrition; that the fluids, thus morbidly absorbed, are rapidly conveyed into the circulation, particularly the chyle, to the kidneys, which concur in the morbid action; that the cutaneous and other exhalations are hence completely arrested; and that the flux of saccharine urine is thus produced. This is certainly a more plausible doctrine than that on which it is evidently founded; but, even conceding the morbid excitement of the lymphatic system and of the kidneys, the origin of this excitement in a morbid virus or matter is much more gratuitous, and the cause of the saccharine properties of the urine is wholly unexplained.

20. 4th. Dr. CLARKE, and more recently Dr. MARSH, impute the disease, in a more especial manner than has been done by other pathologists, to the cutaneous surface, which, indeed, may be viewed as an important organ of the animal economy; and they consider it "as a sweat driven in upon the kidneys, where this morbid determination keeps up a profuse discharge." This opinion seems to have been partially entertained by RITTER, STOEHLER, and RICHTER, who, whilst they ascribed diabetes, as we have seen, in part to a morbid state of the kidneys, conceived that a depraved function of the skin was also concerned in its production. There can be no doubt that suppression of the cutaneous functions is an early change, and that it contributes to the perpetuation and aggravation of the malady.

21. 5th. Others refer diabetes to a dyscrasy or morbid condition of the blood, arising from a diseased state of the assimilating powers of the frame. This doctrine is not materially different from that which was proposed by WILLIS and SYDENHAM, and more recently by PLACE, DESAULT, and LATHAM; and, as well as being more accordant with the procession of morbid phenomena, has a more obvious relation to the exciting causes, terminations, and morbid appearances in fatal cases, than any of the theories now reviewed. According to this doctrine, diabetes is not to be imputed to the derangement of a single organ or system of

vessels merely, but rather to defective energy of the whole frame, particularly impeding the advanced stages of the processes of digestion and assimilation. That the blood is not in a healthy state, and the chyle imperfectly assimilated to it, as well as the crisis of the whole circulating mass deficient, is sufficiently manifested in the appearances which the blood presents when taken from the patient during life, and when observed in the vessels after death. Upon examining specimens of the blood taken from diabetic patients, M. HENRY and SOUBEIRAN found the quantity of its fibrine and albumen one fourth less than is assigned to healthy blood by BENZELIUS and DARCET; and BACHETONI remarked that oil of almonds passed off with the urine, unchanged in its passage through the digestive and assimilating organs. The state of the blood, also, in the veins and cavities of the heart, is somewhat peculiar — generally being semi-fluid, sometimes resembling treacle, and very dark-coloured. That this state is not primary, but is a consequence of deficient vital energy of the organic nerves, and of the assimilating organs, in connection with impeded exhalation and secretion from all surfaces and organs excepting the kidneys, seems most probable. HUXELAND supposes, that, owing to the changed action of the kidneys, and the unassimilated state of the chyle with the blood, the former of these fluids, with the nutritious parts of the latter, containing the saccharine principles, are excreted with the urine, and occasion the phenomena of the disease. This opinion, in its general bearing, comes as near the truth, perhaps, as any that has been offered; but still it admits of reference to antecedent disorder.

22. 6th. According to the experiments of Mr. M'GAZCOB, the healthy stomach generates saccharine matter to a limited extent, and the stomach of a diabetic patient produces it in excess. In the healthy person, this matter undergoes further changes in the progress of assimilation, but, in the diabetic, it undergoes no such changes but is carried with the chyle into the circulation, and is eliminated by the kidneys. Owing to deficient or exhausted influence of the nerves supplying the assimilating viscera and vascular system, the chyle and saccharine matter contained in it are not perfectly changed into blood, nor are the nutritious parts of the blood attracted by, and identified with, the various structures. This imperfect performance of the assimilating functions must necessarily be attended by deficiency of the secretions and excretions excepting the urinary, particularly the cutaneous, the pulmonary, the intestinal, and the hepatic, as both classes of functions are under the influence of the organic system of nerves. Thus a redundancy of mucus matter and of imperfectly elaborated chyle may be the result, a portion of which will be carried off by the kidneys, as in ordinary circumstances, for as long as these emunctories retain their powers, they are the appropriated safety-valves of the vascular system, by eliminating watery, saline, and other matters, when they become excessive. These states and changes account for the simple excess of urine; the more watery and unassimilated parts of the blood being carried off by the kidneys, instead of being secreted from the cutaneous, the respiratory, and intestinal surfaces, and the action of the kidneys, being once excited

with rhubarb, or the compound extract of colocynth at bed-time, and followed, in the morning, by an active purgative medicine, will be found of service. — *b.* Medicines that act as diuretics may be supposed to be contra-indicated in diabetes. But they are not necessarily injurious; for, if they have a beneficial effect on the body generally, or on the visceral disorders with which diabetes is associated, they may even be of benefit; and if the action of such medicines on the kidneys be energetic, they may change the morbid action induced in these organs by the disordered state of organic nervous influence and of the circulating fluid, and in this way prove beneficial. Among the different substances that have a diuretic effect *colohicum* may be mentioned as having lately been sometimes prescribed in this disease, but chiefly on account of its sedative operation. It may be of some service in promoting the biliary secretion, in increasing the quantity of urea and uric acid in the urine, and in diminishing the irritability of the frame. Its good effects, however, require confirmation, and may probably be ensured by combining it with ammonia or its preparations, or with camphor.

35. *H. Nutrients* in various forms have been strenuously recommended by HOME, ROLLO, DUPUYTREN, NICOLAS, OSWALD, FRANK, CHRISTIE, and many others. Dr. ROLLO particularly insisted upon the nearly exclusive use of animal food, with the view of resisting the secretion of saccharine matter, and furnishing the elements of urea and the animal salts to the blood. There can be no doubt that the greatest benefit has been derived from this treatment. It should, however, be admitted, that it often fails; and that, when it is too freely indulged in, it sometimes occasions a diarrhoea, which exhausts or even carries off the patient. With a knowledge of these occasional effects, Dr. PROUT recommends it with very judicious restrictions, and to be taken with a moderate proportion of farinaceous food; and FRANK advises, in addition to it, the decoction of Iceland moss, or of the *althæa officinalis* with milk.

36. *I.* Besides the foregoing, various other remedies have been prescribed. The *cupri ammonio-sulphas* (in doses of half a grain to a grain twice or thrice a day), *myrrh*, and *valerian*, have received the commendations of FRANK and RICHTER. *Asafoetida* has been favourably noticed by WOLFF; *tartar emetic* combined with *valerian* has been directed by RICHTER. A combination of *asafoetida* with *myrrh* and *valerian* has also been very generally used by Continental physicians. Dr. WATT has employed the *volatile alkali*; and it will certainly often prove an useful adjuvant, combined with other medicines, particularly with opium, or with tonics or diaphoretics; and be serviceable in combating such nervous or sinking symptoms, as sometimes occur in the course of the disease. It may, moreover, counteract the tendency to the formation of saccharine matter, and promote the animalisation and assimilation of the chyle, as well as the formation of urea. Even urea itself has been recently tried as a remedy in this disease by SEGALAS, but instead of changing the mellitic urine, it was found to increase its quantity. HUFELAND, and some other physicians in Germany, have prescribed recent *ox-gall*, in as large doses as the stomach will bear, and frequently with the effect of causing the disappear-

ance of the saccharine state of the urine during its use; the disease, however, has generally returned upon discontinuing the medicine.

37. *K. Blood-letting* in diabetes has been mentioned as far back as the Commentaries of ARCHIGENES ON AETIUS; and it was noticed as an occasional measure by LE FEVRE and ROLLO. But it is to Dr. WATT, that we are indebted for the introduction of this practice in a most decided form. This physician advises full and often-repeated blood-lettings, with the view of arresting the inflammatory determination to the kidneys. This plan has been adopted by Dr. SATTERLY and others with manifest advantage, whilst it has failed with some. Drs. PROUT and HUFELAND consider it beneficial only in the early and acute stage of the disease. Dr. MARSH offers a similar opinion. And my own experience would lead me to employ it, only when the disease is recent, the strength of the patient not much exhausted, and the pulse remains of good strength and volume. When the patient feels much pain in the loins, an additional indication is thereby furnished for resorting to it. Sir DAVID BARRY has advised frequent cupping on the loins in the course of the disease, — a practice which is deserving of adoption in cases of the above description, or when much pain is complained of in that situation. I have found advantage from the application of a number of leeches on the epigastrium, and cupping on the hypochondria, both in relieving the sense of pain and heat complained of in the stomach, and in lessening the quantity of the urine, and of the saccharine matter contained in it. Depletion, as Dr. WATT first observed, certainly improves the state of the blood, and renders the weak and imperfect crassamentum more firm.

38. *L. Blisters and external applications* of a derivative and irritating nature have been recommended by RITTER, DESAULT, VAN SWIETEN, WHYTT, and REIDLIN, to be applied chiefly to the loins and epigastrium. FRANK and WEIZ advise repeated blistering of the sacrum. *Setons*, *issues*, and *moras* have likewise been employed in the latter situation; but I believe without any permanent benefit. The most efficacious modes of derivation are the vapour bath, warm alkaline baths, and thick woollen clothing worn next the skin. *Topical applications* of a tonic and an astringent nature have also been directed to be kept constantly applied to the loins by WHYTT, REIDLIN, and VAN SWIETEN. Of these, however, I have had no experience. I have, however, prescribed liniments to this situation, as well as to the epigastrium, generally composed as follows: —

No. 165. R Linimenti Camphoræ Comp., Olei Terebinth., Linimenti Saponis Comp., aa ʒj.; Pulv. Opii Puri ʒj.; Pulv. Capsici Annul ʒss.; Olei Limonis ℥xxx. M. Fiat Linimentum, cum quo assidue illinantur regio lumbalis et spina dorsæ, mane nocteque.

I have found this application extremely useful in the excessive discharge of albuminous urine, which is not infrequently met with in young subjects. I have likewise employed it with other means in the mellitic state of urine; but it was difficult to determine what share of the temporary benefit derived was owing to it.

39. *ii. The Treatment in which the Author is most disposed to confide.* — It is not easy to form

to ourselves precise and rational indications of cure in this disease, particularly as opinions respecting its nature are not supported by a sufficient number of accurately recorded facts; nor are those which have been observed so constantly present, or so uniformly grouped, as to permit us to draw indisputable pathological inferences, for the basis of therapeutical indications. I shall therefore state succinctly the method of cure, which is sanctioned by my own observation, and by experienced physicians. The remark which has been made by Dr. PARR, Dr. PROUT, and others, that this disease should be viewed in a two-fold light — namely, 1st, as respects its saccharine state independently of the increase of its quantity; and, 2d, as regards this state in connection with an augmented secretion — should be kept constantly in recollection; and, although the discharge of an increased quantity of urine, in addition to its saccharine condition, generally indicates either a more advanced or a more severe state of disease, yet we should be aware that the saccharine change is the more important of the two; and that it is much more easy to diminish the quantity than to improve the quality of this secretion. Dr. PROUT justly remarks, that it is exceedingly doubtful if there be any remedy that exerts a specific action in improving the quality of the urine — at least, there is none at present known. The improvement can therefore be attempted only by those agents that have a tendency — 1st, *To remove the morbid affection of the stomach*; 2nd, *To restore the general health and assimilative energies of the frame*; and 3rd, *To diminish the quantity of the secretion*.

40. These ends are generally all that we can reach; and, by attaining them, we sometimes advance still further, and thereby improve the quality also of the discharge. There are, however, other subordinate objects, which, although they might be accomplished with the fulfilment of the chief ends now proposed, yet often require an immediate regard; and the more especially as their attainment very frequently promotes the chief intentions of treatment. These are, — *a.* To remove a congested, loaded, or oppressed state of the vascular system, and reduce the quantity of the circulating fluid more nearly to a level with the amount of vital power and assimilative function. — *b.* To promote and improve the secretions employed in digestion, and excite the exhalations and secretions from the respiratory and intestinal surfaces. — *c.* To remove the unspirable and harsh state of the cutaneous surface, to increase perspiration; and thereby to lessen the determination to the kidneys. — *d.* To diminish the morbid sensibility and irritability of the frame, with the other morbid phenomena allied to them. The means which we employ in attaining both the principal and the subordinate objects which I have now stated, will, of course, vary exceedingly, according to the particular features of individual cases, and the constitutional powers of the patient. The previous duration of the disease — the degree of activity it may present — the age of the patient — the state of the circulation — and the particular condition of the urine, as respects both its density and quantity, should individually and collectively be considered by the practitioner as circumstances calculated greatly to modify the means of cure; and should

weigh so entirely with the judicious, as to lead them to consider even the best practical suggestions which can be offered as applicable merely to some cases, and as requiring to be varied, and rendered appropriate to others. It must be obvious that we cannot endeavour to attain, *seriatim*, the ends now proposed; for a judicious and an active treatment will often fulfil two or more of them contemporaneously.

41. I have already noticed the opinions of Dr. WARR and others (§ 37.) as to blood-letting. In cases of recent occurrence, with an active state of the circulation, and pain in the loins, with much heat and pain in the epigastrium, or where congestion or oppression of the vascular system exists (§ 40. *a*), I consider general blood-letting, repeated as often as the circumstances may require, as requisite to fulfil the intention stated above (§ 40. *a*). The frequency of, or even the propriety of repeating, the operation will depend much upon the appearances of the blood drawn, and the effects produced by it. If the crasis of the blood be weak — the coagulum being loose, and dark — I have seen no benefit derived from it until the vital energies have been somewhat excited by appropriate means. If, however, doubts respecting the propriety of its repetition be entertained, cupping upon the loins, or upon the hypochondria, or the application of leeches on the epigastrium, according as the sensations of the patient may direct, the practice should be substituted, and carried to an extent, as respects quantity and frequency of repetition, on which the observation of the practitioner will enable him to decide. In protracted cases, when the disease occurs in old subjects, when the debility is great, and the pulse quick, small, or weak, general blood-letting is not productive of benefit. If, even in these cases, much pain, tenderness, or fulness be complained of about the epigastrium, local depletion, as now recommended, may be employed in its vicinity. It will often happen that blood-letting — especially general blood-letting — will, at first, either be inadmissible, or of little or no service; and yet it will subsequently prove of very great benefit, after the other parts of the treatment have prepared the system for it. This fact should not be overlooked at any period of the disease, even in the most unpromising cases.

42. Immediately after depletion, a complete evacuation of the bowels, either by a full dose of castor oil and of spirits of turpentine, or by the following pill, repeated according to circumstances, will generally be directed with advantage: —

No. 166. R. Extr. Colocynth. Co. 3 ss.; Pulv. Ipecacuanhæ gr. iij.; Saponis Castil. gr. viij.; Olei Croci Tiglii M ij. M. Fiat Pilulæ xij. Capiat duas statim et repetantur binae quartâ quâque horâ donec plene ejicerit alvus.

The bowels being freely evacuated by the above means, assisted in more obstinate cases by emetia, of which I believe those with from one to two ounces of turpentine to be the most efficacious, a full dose of opium with camphor should be exhibited, or of the pulvis ipecacuanhæ compositus, or the following: —

No. 167. R. Camphoræ rasæ gr. v.; Pulv. Ipecacuanhæ gr. j.; Pulv. Opil gr. ij.; Pulv. Myrrhæ gr. vj.; Mucil. Acaciæ, vel Conserv. Rosar., q. s. ut fiat Bolus, statim sumendus.

Paris, 1825. — *W. Prout*, Inquiry into the Nature and Treatment of Diabetes, Calculus, &c. 2d edit. Lond. 1825. — *Rochoeur*, Diction. de Méd. vol. vi. — *Hefneken*, in Lond. Med. Repos. vol. xix. p. 265. — *Carter*, in Ibid. vol. xx. p. 390. — *D. Barry*, see Lancet, No. 238. p. 926. — *R. Venables*, On Diab., &c. 8vo. Lond. 1825. — *Vauquelin et Ségalas d'Etchepare*, in Archives Génér. de Médecine, t. vi. p. 625. — *Lobstein*, in Ibid. vol. xviii. p. 432.; et in Répert. Génér. d'Anat. et Phys. vol. ii. p. 356. — *Starkey*, in Transac. of Irish College of Phys. vol. iv. p. 379. — *Boutilland*, Diction. de Méd. et Chir. Prat. vol. vi. p. 249. — *M. Good*, Study of Med. by Cooper, vol. v. p. 494. — *Berndt*, Encyclop. Worterb. de Med. Wissensch. art. *Diabetes*. — *Ambrosiani*, in Annali Univer. di Med. Apr. 1835. — *Maitland*, in Lond. Med. Gaz. vol. xvii. p. 900. — *M. Gregor*, in Lond. Med. Gaz. vol. xx. May 13 and 20, 1837. — *R. Willis*, Urinary Diseases and their Treatment, 8vo. Lond. 1838, p. 196.

DIAGNOSIS. See SYMPTOMATOLOGY.

DIAPHRAGM (from διαφράσσω, I separate).—

SYN. *ῥωτίζωμα*, Aristotle. *Διαφραγμα*, φρένας. *Septum transversum*, Lat. *Der Zwergmuskel*, Ger. *Diaphragme*, Fr. *Midriff*, Eng.

1. When we consider the musculo-tendinous structure, and varied connections of the diaphragm,—that it is situated between three serous membranes, and attached to the vertebral column, the ribs and their cartilages,—that it is traversed by the most remarkable nerves and blood-vessels of the body, and itself provided with important vessels and nerves, that it is in more or less direct contact with the lungs, the heart, the liver, stomach, pancreas, kidneys, and spleen; and intimately associated by its nerves, its vessels, and its functions, not only with the mucous surface of the respiratory organs, as well as with these organs themselves, but also with the digestive and large secreting viscera,—its importance in a pathological point of view must be apparent. The extent of its organic and functional relations are such, that agents acting on either the external or internal surfaces of the body must necessarily influence its actions. It cannot, therefore, be a matter of surprise to find it frequently subject to disorder; but I am at a loss to conceive the reason for the very general neglect with which even its most serious diseases have been treated. This can be owing only to the circumstance of their being imperfectly understood, or referred to some one of the adjoining organs, and viewed as merely symptomatic or secondary affections.

1. **INFLAMMATION OF THE DIAPHRAGM.**—

SYN. *Diaphragmitis* (Hildenbrand, J. Frank, &c.); *Paraphrenitis*, *Paraphrosynis* (Rufus Ephesius, et Auct. Vet.); *Diaphragmite*, *Paraphrénésie*, Fr.; *Zwergmuskell-Entzündung*, Ger.

CLASSIF. III. CLASS, I. ORDER (Author).

2. **DEFIN.**—Acute pain and constriction of the lower part of the thorax, extending to the back and loins, increased upon respiration and raising the body erect, with singultus, convulsive distortion of the angles of the mouth, and very acute inflammatory fever.

3. i. **SEAT.**—Inflammation of only the musculo-tendinous structure of the diaphragm is a very rare disease, particularly in its primary form; and I believe is very seldom met with, excepting upon the disappearance of rheumatism from some external part, or after penetrating wounds and other external injuries. As a consecutive or secondary affection, and especially in conjunction with inflammation of one or more of its serous membranes, it frequently occurs, although often either entirely

overlooked, or mistaken for inflammation of some one of the adjoining viscera. The advantages of being able to distinguish it in practice are not diminished on this account; and it often becomes of great importance to ascertain its existence, whether as a primary or as a consecutive disease.

4. I believe that inflammation may originate in the cellular tissue connecting the serous membranes reflected over the diaphragm to its musculo-tendinous structure, in which case the disease will extend chiefly to either one or both of those surfaces; but that, in the more frequent states of diaphragmitis,—particularly its consecutive form,—the inflammation commences in one of the serous surfaces, and extends thence, through the medium of the sub-serous cellular tissue, more or less to the other structures of the organ.

5. ii. The CAUSES of diaphragmitis, particularly in its consecutive forms, are generally those which are productive of pleurisy, pneumonia, hepatitis, or peritonitis. In addition to those, I may adduce others, which have a more evident influence in producing this disease, viz. punctured and other wounds; external injuries and fractures of the lower ribs; concussions of the trunk, particularly from missing steps on descending stairs, or from falling upon the hips; immoderate laughter; violent retchings; continued crying and weeping; obstinate singultus; currents of cold air, when the body is perspiring; the incautious use of cold drinks, ices, &c.; the suppression of painful emotions; violent efforts of any description; the repression or metastasis of rheumatism; the stoppage of accustomed discharges; and the drying up of old eruptions or ulcers by external applications. Instances of the occurrence of inflammation of the diaphragm from the repression of rheumatism have been recorded by PATERSON (*Mem. of Med. Society of London*, vol. v. No. 32.) and PORTAL (*Anat. Méd.* t. ii. p. 444.); and from healing up old sores, suppressing gout, &c., by AASKOW *Act. Reg. Soc. Med. Hafn.* t. i. p. 205.), BOISSEAU (*Nosographie Organ.* t. xi. p. 620.), WENDT, SELLE, and others. HILDENBRAND considers the habit of wearing tightly laced corsets a cause of the disease. I doubt not that it is, at least, a predisposing cause.

6. iii. **SYMPTOMS, COMPLICATIONS, &c.**—A. Either after rigors, chills, horripilations, &c., or consequent upon disease of some one of the abdominal or thoracic viscera, the patient experiences violent, sharp, burning pain, tension, and cord-like constriction, at the lower part of the thorax, particularly beneath the sternum and hypochondria, and stretching to the loins,—increased and descending lower during inspiration—diminished and ascending during expiration,—augmented by coughing, sneezing, fulness of stomach, and pressure on the abdomen; likewise by vomiting, by the expulsion of the feces or urine, and by bending the trunk of the body in any direction. The breathing is short, frequent, anxious, small, and performed entirely by the intercostal muscles, the abdomen being nearly motionless. The hypochondria fall inwards, or are retracted, and, with the precordia, are sensible to pressure. There are frequently painful and difficult deglutition, referrible to the lower part of the oesophagus and cardia; great anxiety, with occasional interrupted sighs; singultus, particularly towards the close of the disease, involuntary retraction of the angles of the mouth, or risus sardonicus; delirium, which is

this, rather than by any other circumstance; the permanent spasm of the diaphragm and other respiratory muscles preventing the expulsion of the inspired air, and consequently producing a variety of asphyxy. (See art. *Hiccus*.)

23. v. *Paralysis of the diaphragm* is incompatible with the duration of life, and can occur only during the last moments of existence. It may be induced by the inhalation of noxious gases into the lungs, and from virulent poisons, thus constituting another form of asphyxy, and it is produced by injuries of the medulla oblongata, or in its vicinity, or by whatever may interrupt the functions, or injure the *par vagum*. I have met with a case where it followed, at a remote period, fracture by muscular action of the dentated cervical vertebra, as verified on dissection by Professor R. QUAIN and myself.

BRILLON AND HUBER. — *Gedern*, De Loch Affect. l. v. cap. 4. — *Boyer*, *Repercut. Anat.* l. i. sec. 1. obs. 1. — *Morgagni*, *Epist.* vii. art. 14. — *Reid*, *Diss. de Inflamm. Septi transvers.* Lips. 1749. — *Schubar*, *Diss. de Paraphrenitide*. Hal. 1762. — *Schubert*, *De Inflamm. Diaphragmatis*. Wittenb. 1800. — *Meredi*, in *Mém. de l'Acad. de Berlin*, 1764, p. 86. — *Schroeder*, *De Inflamm. Diaph.* Göt. 1772. *Stoll*, *Ratio Med.* l. ii. p. 295. — *De Haro*, *Ratio Med.* par. 1. p. 64. par. 12. p. 17. — *L. A. Ehring*, *Diss. de Inflammatione Diaphragmatis*. Göt. 1771. — *G. M. Gatterer*, *Spec. Hist. Paraphrenitidis Rationem et Curationem*. 1771. — *Adam*, *Prakt. Ausw. über die Muskeln*, in *Act. Hafn.* vol. 1. p. 209. — *L. Acad.* l. ii. p. 34. — *Portai*, *Anat.* 18. — *Hempel*, *De Diaph. Sano et Mor.* — *J. P. Frank*, *De Cur. Hom. Morb.* 4 sur le Rie. Paris, 1814. — *Swediaur*, in *Willis*, 1819. — *Hildebrand*, in *J. M.* p. 267. — *J. Frank*, *Præcox Med.* 2. B. vol. II. sect. 2. p. 2. — *Boissier*, *Præcox Med.* 2. B. vol. II. p. 647. — *Falgaire*, *Pathol.*

DIARRHŒA. — *Σύν*. (*diffuse*, from *διήμι*, I flow through, *ἴα* and *ἥν*). *Diarrhœa Coenteria*, *Rheuma Gastricæ*, *Galen*. *Rheumatismus*, *Alexander of Tralles*. *Diffusio*, *Cælius Aurelius*. *Alui Fluxus*, *Ventris Profluxus*, *Avic.* *Lat.* *Cours de Ventre*, *Dévolement*, *Fr.* *Der Durchfall*, *Beuchfluss*, *Durchlauf*, *Ger.* *Diarrœa*, *Ital.* *A Purging*, *Leemans*, &c.

CLASS. — 2. Class, Nervous Diseases; 3. Order, Spasmodic Affections (*Cullen*).

1. Class, Diseases of the Digestive Function; 1. Order, Affecting the Digestive Canal (*Gœd*).

1. *DEFIN.* — Frequent, loose or fluid alvine evacuations, without tormina or tenesmus.

2. Although diarrhœa may occur as an independent or unassociated complaint, yet may it supervene as an occasional or even common symptom, in several maladies. Dr. *Cullen*, whilst he admitted diarrhœa as a specific disease, yet viewed it as always symptomatic of other pathological states. That it is so in most cases, cannot be doubted; but that it also is, in some instances, an idiopathic disorder, in respect both of its primary manifestation, and of its independence of inflammatory action of the intestinal mucous surface, or of disease of immediately related organs, is equally certain; and fully demonstrated by its cause and progress, — by the effects of treatment, and the appearances observed in fatal cases.

3. I. **SYMPTOMS AND VARIETIES OF DIARRHŒA.** — This disease is usually preceded by various dyspeptic symptoms, sometimes by slight nausea, frequently by uneasiness in different parts of the abdomen, by flatulence, and by pain, particularly before an evacuation takes place. In severe cases,

the abdomen is somewhat distended and tender to the touch, and its temperature increased, and occasionally the stools are preceded by much pain in the tract of the intestines, and accompanied with vomiting, or with fainting, or lethargy; they are always without effort, but are rarely involuntary. Each evacuation relieves for a time the patient's uneasiness, which, however, soon returns. The discharges are usually copious, offensive, and feculent at first; but they soon become more scanty, watery, or mucous — often a proportion to the frequency of the calls to evacuation, after each of which the patient feels more and more weakened. Their number varies from three or four, to twenty or thirty in the twenty-four hours, but they are not so often voided at night as in the day. At the commencement of the attack, and in slight cases, the pulse is generally not materially affected; but when vomiting or much griping pain is present, it is soon increased in frequency. At an advanced period it is usually small, weak, and somewhat accelerated; the countenance being pale, the lips somewhat emaciated, the strength diminished, the skin dry and very sensible of cold. The tongue is often loaded from the commencement of the middle and at the root, and sometimes is red at the point and edges. The urine is generally scanty throughout the complaint. The evacuations vary remarkably as to the nature of the matters composing them, their colour, consistency, smell, and other appearances, not only in different cases, but even in the same case, at different periods. Nosologists have generally divided the disease into varieties or species, founded on the different states of the discharges. But this is not a satisfactory basis of classification, as the appearances of the evacuations do not depend upon definite pathological conditions, although furnish important indications of the seat and state of disease. The most common of these appearances are, the *ferulent*, which usually precedes the others; the *bilious*; the *mucous*; the *serous*; the *chylous*; or *white*; and the *hemorrhœic*. But every practitioner must have observed that not only these discharges present themselves during different periods of the disease, but that two or more of them may co-exist; thus the evacuations are not infrequently, at the same time bilious, mucous and serous, or feculent, bilious, and mucous, or watery and bilious.

1. **IDIOPATHIC DIARRHŒA.** — **CLASS.** 1. **CLASS**, 1. **ORDER** (*Author*).

4. *DEFIN.* — Copious, ferulent, and frequent evacuations, sometimes preceded by griping, or unattended by fever.

5. *A. Diarrhœa of Irritation.* — The first of the diseases comprises most of the cases designated feculent by authors, and termed *D. Nervosa* by *SAUVAGES*, *D. Crapulosa*, by *Cullen*, and *D. Fusa*, by *Gœd*. — (a) It is usually caused by any stimulating or irritating substance received into the stomach; by too great a quantity or quantity of food or drink, or even by a small quantity of that which is unwholesome, or otherwise disagrees with the patient's diathesis, or the existing state of the digestive organs, by indigestible vegetables, particularly cucumbers, melons, salads, &c.; by various acid fruits, particularly plums, pine-apples, &c.; by acrimony generated in the prime viæ, and the quality of the

infants constitutes what is usually called the *watery gripes* (§ 15.), and sometimes gives rise to one or more intus-susceptions; or it passes into chronic diarrhœa, with disease of the mucous and mesenteric glands; or into slow remittent fever, marasmus, and fatal exhaustion.

10. *C. Diarrhœa from excited or inflammatory Action of the mucous Follicles* (*Catarrhus Intestinorum*, of various authors; *D. Catarrhalis*, of BOERHAAVE; *D. Mucosa*, of CULLEN, GOOD, &c.; *Cæliaca Mucosa*, SAUVAGES).—(a) This form generally appears in the course of functional disorder of the digestive organs, particularly indigestion, hypochondriasis, costiveness, and colicky affections; which may be viewed as predisposing to it, by favouring the accumulation of mucous sordes in the follicles and on the internal surface of the bowels; and is excited by the causes already enumerated, especially those of the preceding variety (§ 9.). It occurs most frequently in old persons, or in those who have suffered from chronic disorders of the digestive organs; and in *children*, particularly during the period of first dentition.—(b) The stools often consist entirely of thin gelatinous mucus; frequently, also, of thick mucus, and a considerable quantity of watery or serous fluid; sometimes the mucus is mixed with this fluid and thin feculent matter, or is accompanied with small pellets of feces; and occasionally it has the appearance of a semi-transparent mucilage, passing into a muco-puriform matter. The consistence of the motions varies much; and in some cases they are very offensive, but in others without any odour. In many instances they have a greenish or yellowish green colour; in others, an orange or yellow tint: in a few cases, they are nearly colourless, or white, and thin, constituting the *D. Alba* of HILLARY; the *Fluxus Cæliacus* of some writers: the *Album Alvi Profluvium* of PISO; the *D. Pituitosa* of SAUVAGES; the *D. Cæliaca* of CULLEN; the *D. Chylosa*, or *Laceta*, of several authors. These appearances are chiefly attributable to the morbid action of the mucous follicles in some part of the digestive tube, most probably in the colon: to the presence or absence of the biliary and pancreatic secretions; and to the states of these secretions. This, as well as the preceding variety, may or may not be attended by febrile symptoms, may assume the acute character, and may pass into the chronic form, the mucus discharges in this latter case often presenting a light, whitish, or muco-puriform appearance.—(c) When mucous diarrhœa continues for some time, or becomes chronic, it occasions emaciation; a dry, harsh, or foul skin; and, in children, gives rise to marasmus, disease of the mesenteric glands, &c. When it becomes *chronic*, the stools sometimes assume a whitish, or mucilage-like, or greyish appearance, evincing the absence of bile; or they pass into a muco-puriform state, occasionally streaked with blood; or they contain long whitish shreds, or threads; and consist either altogether of these matters, particularly if the disease be seated low in the large intestines, or of an admixture of thin feculent matter with them, particularly when the upper portions of the colon and termination of the ilium are affected. In some cases of this form, occurring during difficult dentition, or after the use of calomel or mercurials, or upon the suppression of ptyalism, the stools have

consisted of a thin, ropy, mucus, of a translucent hue, and have seemed to be chiefly augmented pancreatic secretion. In *children* especially, when mucous diarrhœa has assumed the *chronic* form, the evacuations often present the *chylosa* or milky appearance just noticed, — the *Chylosa Diarrhœa* of DEWEES and others. This state is attributed by them to the presence of chyme, or imperfectly elaborated chyle, which the lacteals refuse to absorb; and to the absence of bile: to which causes it is very probably partly owing, as well as partly to the morbid secretions of the mucous surface and follicles. Whatever appearance this variety may assume, it is frequently followed by the next.

11. *D. Diarrhœa from Ulceration of the mucous Follicles* — (a) occurs either consecutively of the two foregoing varieties, or in the course of several febrile or chronic diseases; in which cases, however, it is very often preceded by serous or mucous evacuations, or by both. But ulceration may take place without any such indication, and without the bowels being much, or even at all, relaxed.—(b) The stools are usually muco-puriform, streaked with blood; sometimes containing shreds or threads of albuminous matter and mixed with thin, watery feces, particularly when the disease is seated in the small intestine or cæcum. When the large intestines are chiefly affected, the muco-puriform discharges may contain little or no feculent matters; or these matters may form distinct portions of the stools, or may consist of detached pellets. In some instances, the stools have been very dark, grumous, watery, and foetid; and, occasionally, merely thin, serous, or mucous, or both, varying in colour, and more or less feculent and offensive; and yet ulceration has nevertheless existed. In rarer cases, they have been quite black, grumous, and melanoid; or resembling ink, probably from the admixture of blood exuded in the small intestines, and changed by the action of the secretions — whether healthy or morbid.—(c) In this variety of diarrhœa, the emaciation becomes extreme, and the skin assumes a dry, harsh, foul, or lurid appearance. The pulse, in its latter stages, is quick, small, and weak. Aphthæ sometimes appear on the lips and tongue; and hectic fever, with exhaustion, prevails.

12. *E. Diarrhœa with the Discharge of undigested Ingesta*; *Lientery* (*Λιεντήρια*, Gr.; *Lubricities* vel *Levitas Intestinorum*, Lat.; *D. Lienterica*, of CULLEN; the *Lienteria* of SAUVAGES and others).—(a) occurs more frequently in *children*, before the period of the second dentition, than at later epochs; and it is generally the consequence or sequela of inflammatory irritation of the digestive mucous surface, and disease of the mesenteric glands — of the advanced stages of these pathological states. It is most common during the first dentition, particularly when the canine and molar teeth are about to appear; and, in this class of patients, as well as in adults (in which latter it is comparatively rare), it either follows dysentery, or is a concomitant of the last stages, or chronic states, of one of the preceding varieties, — commonly of the *serous* or *mucous* — than a primary form of the disease. It is caused by the same remote agents which induce these its primary conditions; and it evidently depends upon a morbid state of increased peristaltic action, and defective vital function of the stomach and duodenum, so that which obtains in the intestines; the food

the intestinal mucous coat. The treatment should therefore be directed, in such cases, with the intentions of diminishing inflammatory action in this part by moderate local depletions, of equalising the circulation and secretions by external derivatives and relaxants, and by diaphoretics and diuretics, and of supporting the powers of life, whenever they become depressed, by diffusible and permanent stimulants. I may state as the result of experience, that, when this complication follows an imperfect developement, or retrocession, of the cutaneous eruption, even moderate depletions are not well borne, unless they be accompanied by warm diaphoretics and diffusible stimulants; and that, of the latter medicines (which are very generally appropriate), full doses of ammonia, or of camphor, or of both, in some instances combined with nitrate of potash, in others with alkaline carbonates or magnesia, in most with demulcents and emollient diluents, in several with laxatives, and in many with aromatics, or tonics and antiseptics, have proved the most beneficial.—(e) When a diarrhœa that is not critical accompanies or follows remittent, continued, or adynamic fevers, the evacuations being watery, muddy, dark-coloured, or otherwise morbid, the hydrarg. cum creta, with ipecacuanha, camphor, and cretaceous substances; or the terebinthines and the balsams, with vegetable or mineral astringents; also tonics and antiseptics, the nitric and hydro-chloric acids, or both, or rhubarb with magnesia; the chlorates with demulcents; external derivatives with warm rubefacient and stimulating liniments, &c., are the chief remedies, and the most likely to prevent the extensive sloughy ulcerations that sometimes attend the diarrhœa that supervenes either during, or subsequently to, these diseases.

39. *Colliquative diarrhœa* is sometimes not easily controlled; and even when most readily repressed, the constitutional disturbance may be thereby increased. It is most benefited by small doses of the sulphates of copper and of zinc (F. 577. 587.), by the mineral astringents generally, and by the cretaceous and demulcent preparations, combined with camphor, aromatics, and opiates, or with tonic and astringent infusions and decoctions, which, at the same time that they alleviate the symptoms, also support the vital energies. But the adoption and combination of these, or the choice of other remedies already or about to be noticed, should depend mainly upon the nature of the primary disease, of which the diarrhœa is, in this state, merely an advanced symptom.

40. *Cautions, &c.*—The critical manifestation of diarrhœa should never be interfered with, unless it either proceed so far as to depress the vital energies, or be attended by signs of inflammatory disease of the mucous surface and follicles, in which case the treatment recommended for the varieties indicative of such disease and its consequences should be prescribed. When diarrhœa occurs in gouty or asthmatic persons, or in those of a plethoric habit of body, or who have a tendency to, or have suffered from, cerebral affections, or hepatic disorders; or in the leuco-phlegmatic and hydropic diathesis; it ought to be treated with much caution; and should be only at first moderated, if very severe, by mild purgatives or laxatives; by depletions, diaphoretics, and diuretics; by a regulated diet; and by warm clothing,

according to the circumstances of the case, because the sudden arrest of the evacuations by opiates and astringents may be attended by some risk.

41. vii. NOTICES OF PARTICULAR REMEDIES RECOMMENDED BY AUTHORS, &c.—A. *Bleeding* has been advised by COTUGNUS (*De Venæsect. in Diarrh.* Rom. 1604.); by HORSTIUS (*Opp.* iii. p. 68.); by ZACUTUS LUCITANUS (*Med. Pr. Hist.* 1. ii. p. 734.); in the bilious variety, and by SYDENHAM. It is obviously requisite in the inflammatory states of the disease, whether acute or chronic, and preferably by leeches applied to the abdomen, to the sacrum, or to the verge of the anus, particularly when tenesmus is present.

42. B. *Refrigerants* are always beneficial in the serous and mucous varieties, and when the complaint is attended by increased heat or excited circulation, and erect papillæ of the tongue; and they may be combined with demulcents and opiates (F. 36. 821. 838. 886.) according to the circumstances of the case. Of this class of medicines the *nitrate of potash* or of *soda*, *camphor* (F. 431.), the *muriate of ammonia* (F. 352. 431.), *borax* (F. 209. 630. 867.), variously combined, and the *tepid bath*, are the most appropriate. RECAMIER (*Annuaire Méd. Chirurg.* vol. i. p. 113.) recommends nitre with the *oxyde of bismuth*, and opiated aromatics. HUFELAND prefers the *muriate of ammonia* (STARK, *Archiv.* b. i. st. 3. p. 93.) in the inflammatory states, and when it accompanies fever; and ZADIG combines it with mucilaginous substances (*Journ. der Erfind.* st. xxi. p. 57.).

43. C. *Laxatives* and *mild purgatives* have already been sufficiently noticed. Those of an irritating nature are not unfrequent causes of the complaint, and ought never to be prescribed. Even castor, olive, or almond oil, if they be in the least acrid or rancid, will be productive of much mischief. I have seen enteritis supervene on diarrhœa from this cause. In the chronic states of the disease, *sulphur*, with cream of tartar and sub-borate of soda in the form of electuary (F. 790.), and conjoined with aromatics, is often the best laxative that can be employed. It has been preferred by LANGE (*Miscell. Verit.* p. 29.) and it possesses the advantage of relaxing the skin.

44. D. *Diaphoretics* are of much benefit in all the febrile states of the disorder, particularly the serous variety, and are advantageously combined with refrigerants. They have been adopted by SYDENHAM, DIEMERBROECK (*Observat. et Curat.* No. 64.), LENTIN (*Beyträge*, b. iv. p. 332.), OSIANDER (*Denkwürdigkeiten*, b. ii. p. 179.), &c. The chief of this class are James's powder, ipecacuanha, camphor, carbonate and acetate of ammonia, spiritus ætheris nitrici (F. 394. 840.), &c. *Ipecacuanha*, particularly when associated with nitrate of potash, camphor, and opium, is one of the most certain and efficient remedies we can prescribe in all the acute forms of the disease; and it is also a very useful adjuvant of other medicines (see F. 39. 495. 642. 744. 924.). It has been very generally used, and particularly by LINNÆUS (*Amæn. Acad. Upsal.* vol. viii. p. 246.), FOTHERGILL (*Med. Observat. and Inquir.* vol. vi. art. 18.), BALDINGER, (*N. Magazin.* b. xix. p. 404.), STARK, LOEFFLER (*Beyträge*, b. i.), and BROUSSAIS (*Loc. cit. in Bibli.*), either in the combinations now noticed, or in those constituting the

of the same colour in the healthy state. It may be—(a) perfectly *white* or *whitish*, although this state does not imply that functional disorder did not exist during life.—(b) It may present various tints or *degrees of colour*, without ceasing to be sound, depending, 1. on the performance of the digestive processes, shortly before or at the time of death; 2. on the congestion to which internal vascular parts are liable at the last agony or moments of life; 3. on mechanical obstacles to the return of blood in the veins existing a longer or shorter period before dissolution; 4. on the gravitation of the blood to depending parts; 5. on the exudation of blood through the parietes of the vessels; 6. on the exudation of this fluid through the capsule of the spleen; 7 on the gases existing in the canal at the time of death; 8. on the developement of other gases at a remoter period, when putrefaction commences; 9. on the combination of the colouring matter of the bile present in the digestive tube, with parts of its mucous surface; and 10. on the medicinal or other ingesta, which may change its colour so as to resemble the morbid state. Some of the colours produced by these causes cannot be confounded with that resulting from inflammation; others very nearly resemble it, especially those occasioned by the 1. 2. and 4. and certain varieties of 3. and 5. Those states of the digestive surface that most nearly resemble inflammation, may in respect of it be denominated *passive*. M. BILLARD has given the following *diagnosis* between *passive* and active or *inflammatory* redness of the villous or digestive mucous coat.

<i>Inflammatory.</i>	<i>Passive.</i>
a. With or without manifest thickening of the membrane.	a. The same.
b. Indifferently in a depending or elevated part.	b. Almost always in a depending part.
c. Without general injection of the abdominal vessels, and without any obstacle to the course of the blood; sometimes consisting in only a slight local injection.	c. With general injection of the abdominal vessels, and with an obstacle to the course of the blood; rarely being an isolated local injection, but frequently occupying a fold of the intestine, or the whole intestine.
d. With considerable tenderness of the sub-mucous tissue, and a capability of raising the mucous coat in large patches.	d. A power of raising the mucous membrane in shreds only, which is the case in health.
e. With thickening and abundance of the intestinal mucus; and sometimes with sanguineous exhalation.	e. Without abundance or thickening of the intestinal mucus; but sometimes with sanguineous exudation.

6. This diagnosis refers merely to the differences between *redness* from inflammatory irritation and redness from passive congestion. The various results of inflammation of the mucous membrane are entirely left out of the question. This tissue seldom experiences any change in *density* within the period which usually elapses between death and the examination. Therefore, *softening* can very seldom be justly considered a *post mortem* change. In respect, however, of the stomach, the case has been supposed to be otherwise, and upon good grounds. The observations of J. HUNTER and ALLAN BURNS on the human subject; of CARLISLE, COOPER, and WILSON PHILIP, on rabbits; of ADAMS, BRETONNEAU, and TROSSEAU, on dogs; and of SPALLANZANI on fishes; show that the solvent action of the juices of the stomach may be exerted upon itself, within twenty-four

hours from death, so as not only to soften its villous coat, but to dissolve both it and the coats exterior to it, until the organ is perforated or destroyed in one or more places. The possibility of this occurrence is shown by the experiments of STEVENS, LOVELL, and others, demonstrating the solvent power of these juices; and that it actually takes place, is established by the experiments of Drs. CAMERER and CARSWELL, as well as by the sound health of the subjects of it at the time of death, and the absence of inflammatory appearances around the destroyed part, or in the peritoneal coat. The healthy state of the other tissues composing the parietes of the digestive canal, and the natural capacity and position of its different parts, require no remark.

7. I. FUNCTIONAL DISORDERS.—The disposition, which has prevailed for many years, and which is still so manifest in medical literature and practice, to impute every morbid condition to inflammatory action, and changes of structure, has been displayed more in this branch of pathology than in any other. Since the appearance of the writings of MARCUS, and especially since the promulgation of the doctrine of BROUSSAIS, all the states of disorder referrible, directly, or sympathetically, to the digestive organs, have been considered by many to arise from inflammatory irritation and action, or their consequences, in various grades or states of activity; and even those who have not adopted the views of this very zealous writer, have too generally overlooked the primary and controlling influence of the vital endowment in the origin and removal, not only of the diseases of the alimentary canal, but of its related viscera, and, indeed, of those of all other organs. The pathologist who observes closely the action of the numerous agents which either merely change the conditions of life, as manifested in the sensitive and contractile systems, or which produce alterations of structure cognisable by the senses, and who notes the manner in which primary impressions affect related and even remote parts, must have often remarked, that some connection subsists between the nature of the agent, the particular system acted upon, and the effect produced; that the more obvious and palpable lesions are generally remote and often only contingent results; and that alterations apparently identical are often associated with, even when they are not the consequences of, very different states of sensibility and contractility, as well as of the other manifestations of vital power. It is necessary to our enquiries into the morbid states of a part, which, with reference to the formative and vegetative processes especially, is primarily and essentially vital, and which, from its intimate connection with the organic system of nerves, powerfully influences, whilst it is itself influenced by, the vital endowment or appropriate influence of this system,—of a part especially devoted to the preparation of the materials for the reparation of the structures, and the support and perpetuation of life,—to view its changes of function and of structure accordingly, and with strict reference to the foregoing considerations.

8. i. *Changes in the Desire for Food and Drink.*—If the alimentary canal be admitted to be, of all parts of the economy, that in which identity of lesion the least infers identity of symptoms, the same admission should be extended to the

When this latter occurs, the follicle becomes distended by its secretion, in some cases, to such an extent as to form large globular tumours. The parietes of the hypertrophied follicle may also be transformed into a fibrous, or fibro-cartilaginous, or even a cartilaginous tissue, thereby augmenting their thickness,—a change justly imputed by M. GARNIER to chronic inflammation. Hypertrophy of the follicles is most common in the inferior part of the ilium, in the cæcum, in the rectum and colon, and in the duodenum, but is rarely met with in the stomach. It is most frequently a consequence of *diarrhæa*, *dysentery*, and *gastric fevers* (which see); and may be mistaken for tufts of enlarged white villi, and for small white bodies, consisting of the rudiments of *valvule conniventes*. It is very common after the bowel complaints of children, amongst whom, however, the follicles are always more manifest than in adults.

30. (b) *Hypertrophy of the sub-villous tissues* may be more or less general throughout one of the principal divisions of the digestive canal, or it may be circumscribed. It is not unusual to find, after chronic diarrhœa or dysentery, the *sub-mucous cellular tissue* much more apparent than usual, or even two or three lines in thickness, in the colon or rectum, or both. It is then denser than natural, sometimes with more or less regularly arranged fibres, or plates, of a pale or pearly white colour, and without any evident blood-vessels. It is often of a homogeneous semi-cartilaginous-like texture; but when thus generally *enlarged* and *indurated*, the hypertrophy is never so great as when it is circumscribed. When it forms, in some part of the canal, a tumour, elevating the mucous surface by its thickness, it constitutes the change to which the term *scirrhus* has been very generally applied, and differs from the diffused hypertrophy only in being circumscribed, and many times thicker. That the tumour occasioned by the circumscribed hypertrophy, whether existing in the cardia or pylorus, is not the result of the production of a new tissue, but arises from enlargement and *induration*—owing to excessive irritation—chiefly of the sub-mucous tissue, is manifest in the early states of the lesion. This may continue to be the only change; but often ulterior alterations take place, and a new structure is developed; the part becomes vascular, is sometimes divided into lobes, and morbid secretions are poured into its substance, whereby it acquires the appearance of areolæ and cells containing these secretions; the fibriles of the cellular tissue between them becoming at the same time more and more hardened and hypertrophied. Frequently the hypertrophy is not confined to the sub-mucous tissue, but is extended to the tissue connecting the muscular and peritoneal coats; hardened, with fibres running between and separating the fasciculi of the interposed muscular coat, and thereby connecting both layers of hypertrophied cellular substance. M. ANDRAL considers these fibres to consist of the cellular tissue placed between the muscular fibres, also in a state of hypertrophy; the latter structure gradually disappearing before the progressive increase and induration of the former. At last, all appearance of muscle is lost, and a mass either of simply hypertrophied and indurated cellular tissue, or of this substance further and consecutively altered, chiefly by the deposition into it of morbid

secretions, is placed between the peritoneal and mucous coats.

31. This lesion is generally the consequence of inflammatory irritation long kept up or frequently reproduced in the mucous membrane, which may be sound, no change of it having existed, or that which formerly existed having ceased. More frequently, however, it is either injected, indurated, softened, ulcerated, or entirely eroded in the hypertrophied part. Hypertrophy of the sub-mucous tissue is most frequent in the stomach and large intestines, particularly the rectum, where it may be either diffused or circumscribed; and the least so in the small intestines, in which it is commonly circumscribed. It is rarely met with in infants. MM. BILLARD and ANDRAL have, however, observed it in them; and I have seen it in the colon of children a few years of age, who had long been affected with chronic diarrhœa. It seldom is seen in the stomach before thirty; but it is common in this viscus between the ages of thirty-five and sixty-five, especially near the pylorus and cardia.

32. (c) *The muscular coat* is sometimes hypertrophied, either alone, or along with the submucous tissue. In the former case, the pyloric orifice of the stomach is its chief seat (CRUVEILHIER, R. PRUS, LOUIS, BOUILLAUD, ANDRAL, &c.), and is much increased in thickness from this circumstance. In hypertrophy of the sub-mucous tissue, the muscular coat, instead of disappearing before the increasing bulk and induration of the cellular tissue that surrounds and penetrates it, as most frequently occurs, and as above described, is sometimes also hypertrophied. In this case, when a section is made of the diseased part, the hypertrophied muscular coat may be traced, in the form of a bluish semitransparent layer, placed between two other layers of a whitish colour, consisting of the sub-mucous and sub-peritoneal cellular tissue also in a state of hypertrophy. This central or muscular layer is traversed by lines of the same colour as the layers on each side of it; the enlargement and induration thus extending to the muscular coat, and through its fibres, by means of their interposed cellular tissue, to that connecting it with the peritoneum. This lesion is most frequent in the stomach, particularly near the pylorus, and constitutes, as well as the preceding states (§ 27.)—often with various alterations of secretion superadded—what is usually called *scirrhus*. (See STOMACH—*Diseases of*.)

33. C. *Hypertrophy of the nerves and vessels.*—(a) The *nerves* supplying the gastro-intestinal canal are very rarely enlarged. M. ANDRAL has never observed any such change in them. M. R. PRUS, however, found, in a case of circumscribed hypertrophy of the sub-mucous tissue and muscular coat (*scirrhus*) of a part of the body of the stomach, the right œsophagæan branch of the pneumo-gastric nerve increased to twice its bulk, from the cardia to its disappearance in the tumour. It should be recollected, that the state of the nerves is seldom enquired after in *post mortem* inspections, and that to ascertain the condition of the ganglial nerves requires the most minute research, which can seldom be devoted under such circumstances.—(b) The *blood-vessels* of the gastro-intestinal tube are very often large and dilated; but this is not hypertrophy. Their parietes are very rarely thickened. M. ANDRAL found, in two cases of

tom, although not constantly or generally connected with any one pathological state. Increased exhalation of the intestinal gases is, however, a very frequent, although not a constant, result of inflammatory irritation of the villous membrane, or of disease of Peyer's glands; but it may also proceed from extreme debility, manifested especially in the organic nervous system, and by the bloodless state of the digestive canal found after death. Hysteria, hypochondriasis, asthma, flatulent and lead colic, rabidity, and other affections, are characterised by great accumulations of air in the intestines, without any sign of vascular irritation of the villous surface. These gaseous collections are generally greatest in the large intestines; but they also take place in the stomach and small intestines, particularly in the latter, as observed in the last stages of typhoid fevers, and of various other acute diseases. The meteorismus of fever has been imputed by BROUSSAIS to disease, especially ulceration of the intestines; but, although the connection is frequent, it is by no means general, and, even when observed, both pathological states are merely associated effects of the same anterior change, viz. diminished vital power, expressed particularly in the organic nervous system and viscera influenced by it. The formation of air in the digestive canal has been chiefly attributed, in the article on COLIC, to exhalation from the villous surface. The flatus may also arise partly from the chemical reaction of the diversified and heterogeneous substances taken into the stomach, as they are acted upon by the secretions and are propelled along the canal, and a portion of air is commonly swallowed with the ingesta.

45. (b) *The fluids and secretions foreign to the digestive canal in health*, but which are sometimes found in it, are, blood, pus, coagulable lymph, melanotic matter, tubercular matter, concrete or fluid fatty matter, a thick albuminous substance, calculous concretions, and worms.—

a. *Blood* is occasionally found in the stomach and intestines, both in a fluid and coagulated state, and in very variable quantity. The causes of its effusion on the free surface of the villous coat are—1st, Atony of the extreme vessels, and diminished vital cohesion of the coat;—2d, A mechanical obstacle to the return of the blood, particularly in the vena portæ;—3d, Inflammation or irritation of the villous membrane in various states of intensity and morbid association, supervening either spontaneously, or caused by irritating ingesta;—4th, A morbid or dissolved state of the blood itself, most frequently, however, associated with the 1st state, as in scurvy, the black vomit of yellow fever, and purpura hæmorrhagica;—5th, The erosion of the coats of a blood-vessel in the seat of an ulcer;—6th, Disease of the coats of a blood-vessel, independently of any lesion of the villous coat;—and 7th, from having been swallowed, as in cases of excessive hæmoptysis, hæmorrhage from the fauces, &c. When the sanguineous effusion proceeds from the third source, it may be either very slight, the mucus covering the villous surface being merely tinged with it, or very considerable, according to the various concomitant circumstances under which it may take place. Its fifth and sixth sources are the most rare, but not so rare as M. ANDRAL supposes, the sixth

being entirely overlooked by him. M. PROST, Dr. ABERCROMBIE, and others, have detailed instances of the former; and a case of the latter, from atheromatous deposit in the coats of an arterial vessel disposing it to rupture, very recently occurred in my own practice. (See HÆMORRHOË — *from the Digestive Canal*.)

46. β. *Puriform matter* is but rarely met with on the villous surface, instead of the mucus usually secreted by it, in any appreciable quantity. It is much more commonly found in the follicles, either in an inflamed state of this coat, or independently of any marked injection of its vessels. When the follicles contain this fluid, they generally present the appearances already described (§ 22. c., 36. a.), especially the conoidal and pustular state, the puriform matter escaping on incising them.—γ. Dr. MONRO describes a *brown fluid* like cocoa, which he has seen in some instances voided in large quantity during life from the stomach. In a fatal case, this viscus was very large, and half filled with this fluid, its coats and adjoining viscera being sound.—δ. *Coagulable lymph*, in various grades of density, and in the form of false membranes, is also sometimes found on the gastro-intestinal villous surface; but not so often as in the mouth, pharynx, and œsophagus. I have observed it most frequently in the form of whitish flocculent or thin membranous-like patches and shreds, covering the inflamed or partially injected surface, in fatal cases of scarlet fever, with gastro-intestinal symptoms. In sub-acute inflammatory affections of the digestive organs, either with or without diarrhoea or dysentery, as in the cases described by BAILLIE, POWELL, GOOD, ANNESLEY, LELUT, BILLARD, &c., the false membrane is occasionally so complete as to form a tube of various dimensions, which, when evacuated with the stools, has been mistaken for a sphacelated portion of intestine, or for its mucous coat. Dr. GODMAN found it covering the whole villous surface of the stomach; and Mr. HOWSHIP remarked a similar production in a child that had accidentally swallowed boiling water. M. ANDRAL thinks that it may sometimes proceed from a morbid secretion of the mucous follicles; but, as in the other situations in which it is seen, it evidently arises from inflammatory action of the villous or mucous coat itself, the exhalant vessels of which, in the inflamed state, throw out coagulable lymph instead of their usual watery or serous exhalation; these vessels also sometimes secreting puriform matter, in a modified form of disease.—ε. The gastro-intestinal mucous coat sometimes exudes a *black matter*, the *melanosis* of modern writers. This substance exists either in a fluid form, on the free surface of the membrane, or combined with its tissue, or in both forms in the same or different parts of the canal. When merely deposited on the free surface of this coat, it can generally be washed off; the matter composing it staining linen. But when it is infiltrated or combined with this tunic, it cannot be removed by ablution, and it does not stain linen. It is most apparent at the bottom of the lacunæ in the duodenum, or in the summits of the villi, or in the margins of the orifices of Peyer's glands, or in the bottoms of small ulcers.—ζ. *Tuberculous matter* is sometimes found in the follicles, the intestines being studded with

of those alterations, and the treatment they require, because the same lesions, seated in different parts of the canal, are attended by different phenomena, and claim modified means of cure; reference being made to the changes here described. Therefore, the diseases of the digestive canal should be also studied in the following articles, which contain most of what is known respecting them:—CÆCUM, COLIC AND ILEUS, COLON, CONCRETIONS, CONSTIPATION, DIARRHŒA, DUODENUM, DYSENTERY, FEVERS, INDIGESTION, INTESTINES, ŒSOPHAGUS, PERITONEUM, PHARYNX, RECTUM, STOMACH, WORMS, &c.

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termine, or otherwise aid, those which preceded it, and which, although the principal or exciting causes, were insufficient, until thus reinforced, fully to produce the disease. Owing, also, to the condition of the frame, no effect will sometimes follow one, two, or even three exciting causes; and until a greater number are brought into operation, no mischief will often result. The effects produced by various animal and vegetable exhalations on different individuals, or upon the same person at distinct periods, under different states of mind and predisposition; and by the action of numerous concurrent, accessory, and determining causes; fully illustrate this position. It is chiefly owing to a want of knowledge of the doctrine of causation, that so much error and difference of opinion prevail respecting infectious and non-infectious diseases. On the other hand, persons may be so very easily affected, that causes of the slightest nature, and such as are determining or accessory in the majority of cases, are *principal* in respect of them; and influences which are usually *predisposing* are often, in such persons, the *exciting* causes of disease. Also those which are *remote* in their operation on some constitutions, are *direct* or *immediate* in respect of others. Examples of this are found in the diseases of the lungs, liver, stomach, and bowels. In considering the agents which affect either the functions, or the organisation, I shall first notice those which generally *predispose* the system to disease; next those which *excite* disease in a direct or immediate manner; afterwards such as are specific, or produce determinate results; the effects of their operation on the living frame being obvious, and often admitting of being foreseen; and lastly those circumstances which sometimes determine, reinforce, or call into action, exciting or specific agents.

10. I. OF THE PREDISPOSING CAUSES OF DISEASE.—These may be classed—1st, into such as are proper or peculiar to individuals, and the circumstances in which they are placed; 2d, into such as are not proper or peculiar to individuals, but which may affect various persons, and even numbers of persons, but individually and occasionally; and, 3d, into such as are general, and affect more or less all who are exposed to them.—A. *Those which are peculiar to the individual*, and to the circumstance in which he is placed, and which may be called the individual predisposing causes, are—1st, original conformation and hereditary predisposition, age, sex; temperaments, original and acquired; habit and constitution; trades, professions, and circumstances of life, &c.; and, 2d, the various external and internal agents, and circumstances modifying the state of the functions,—as previous functional disorder, and convalescence from disease; and the pregnant and puerperal states.

11. a. *Original conformation and hereditary predisposition*.—It is generally observed, that the constitutions, temperaments, and diathesis of the offspring closely resemble the parent; and that whatever disposition to disorder, whether of function or of structure, the latter may have possessed, is liable to evince itself in the former. From this circumstance having been very generally remarked in respect of certain maladies, they have been termed *hereditary*. But it must not be supposed that children are actually born

with the diseases of their parents. This is but seldom remarked; although, in rare instances, I have observed the commencement of tubercles in the lungs of a new-born infant by a consumptive mother; and small-pox and syphilis are sometimes communicated to the foetus *in utero*, occasioning in some instances its premature birth, and even its death, either previously to or about the natural termination of utero-gestation. Hydrocephalus, cataract, and various imperfections of the organ of hearing, and, indeed, of other organs of sense, are not infrequently congenital, or examples of disease from *original conformation*; but, in such cases, it is rare that the parent is similarly affected at the time, although the hereditary predisposition, as about to be explained, exists nevertheless; and, as respects the first of these, a tendency merely to the disease could have existed at an early age in the parents. It should be kept in recollection, therefore, that the foetus *in utero* may be affected by several cachectic, inflammatory, or even febrile diseases, communicated by the parents, or supervening *accidentally*: but, of those which are thus communicated, even the majority are not, properly speaking, hereditary; and those which are accidental do not depend upon the constitution of the parents, or the ailments experienced by the mother during the period of gestation. *Congenital diseases* are consequently divisible into—1st, Those which occur in the foetus, without any participation on the part of the parents,—as imperfect development of organs, inflammations, effusions of fluid in various parts, &c.; 2d, Diseases in which the foetus participates with the mother, owing to their contaminating influence, or their extension throughout her organisation,—as syphilis, small-pox, fevers, &c.; 3dly, Those that affect the foetus from a constitutional liability in one or both parents,—as hydrocephalus, cataract, tubercles, &c.

12. Most commonly, however, the child is born free from disease; but, inheriting the constitution and diathesis of the parent, has that condition of function and organisation which renders it more susceptible of impressions produced by the exciting causes of certain maladies. Examples of this may be contemplated daily in respect of diseases of the lungs and brain; the constitution and functions of these viscera disposing them or rendering them more prone to experience those derangements by which the parent or parents had been affected. In some instances this predisposition may be more strongly marked in the child than in the parent; and in other cases the predisposition may be extremely slight, and only brought to light by the operation of the more energetic agents.

13. The predisposition of the offspring generally evinces itself more strongly at certain ages than at others, according to the kind of morbid constitution or predisposition which it may inherit, the causes to which it is exposed, and the nature of the malady which results. Thus, the disposition to *hydrocephalus*, *convulsions*, *idiocy*, *rickets*, *scrofula*, *cataract*, &c., is most apparent soon after birth, and at early epochs of life; to *epilepsy*, *hemorrhage*, and *pulmonary consumption*, about the age of puberty, or previously, or soon after; to *gout*, *asthma*, and *angina pectoris*, in adult and mature age; to *insanity*, *apoplexy*, and

28. (*f*) *Indolence and too great exertion*, both predispose to and occasion disease; whilst moderate exercise, especially in the open air, increases the energies of the frame. Fatigue generally favours the impression of causes which produce acute affections, as fevers and inflammations; whilst indolence and sedentary occupations dispose to chronic maladies, as congestions of the liver and abdominal organs, to corpulency, apoplexy, hæmorrhoidal affections, and derangements characterised by diminished tone of the nervous and vascular systems.

29. (*g*) *Sleep*.—The want of this restorer of the vital energies favours the invasion of fevers, inflammations of the brain, and disordered manifestations of mind; whilst too much sleep, and the horizontal posture too long retained, or too frequently assumed, predispose to apoplexy, paralysis, softening of the brain, inflammation of the cerebrum or of its coverings, and affections of the kidneys. Many, also, of the causes of acute diseases make their impression during sleep, when the body is relaxed, and thereby exposed to their invasion. On the other hand, early rising promotes both mental and corporeal energy. It has been remarked by the actuaries of Life Insurance Companies, that early rising is, of all habits, the most conducive to longevity; all long lives being early risers.

30. (*h*) Due regulation of the temper, the passions, and desires, and a proper conduct of the imagination, are also necessary to resist exciting causes. Indulgence of temper and passion not only predispose to disease, but also frequently directly excite it, particularly in nervous, irritable, and sanguine temperaments. Diseases of the heart, brain, liver, stomach, and bowels, often originate in these sources. Uncontrolled passions of every description occasion numerous functional and structural changes, seated chiefly in the viscera of the large cavities. Moderation in eating and drinking, in sleep, in the indulgence of those appetites, feelings, passions, and desires which have been implanted in our natures by a wise Providence for our advantage, gratification, social improvement, and happiness; an equable state of the mind, with confidence in our powers; and the pleasant excitement accompanying a well-regulated course of application to business or study; are the best means of resisting the impressions of injurious agents.

31. *C. General predisposing Causes*.—Of these, the most universal in their operation are certain constitutions of the atmosphere. Besides the variations in the temperature and dryness of the air, its electrical conditions also vary extremely; but as yet we are not possessed of sufficient data to enable us to state with precision how far these conditions may predispose to, or directly excite, disease, or what particular change in our bodies result from certain electrical states of the atmosphere. But that the electrical conditions, together with a more or less humid state of the air, are connected, in the relation of cause and effect, with the prevalence of disease, is extremely probable, although not satisfactorily demonstrated. Those conditions which predispose to disease are—1st, temperature; 2d, humidity; 3d, these two states conjoined; and, 4th, electrical conditions of this fluid. Two very important subjects, very intimately allied to these, and which act both as

predisposing, exciting, and specific causes, viz., ENDEMIC and EPIDEMIC influences, are considered in separate articles.

32. (*a*) *Temperature* has a considerable influence in generating a predisposition to certain diseases. Thus, in low states of atmospheric temperature the functions of respiration are fully and actively performed, especially as respects the blood; and the diseases observed in such circumstances are of an inflammatory nature, are seated chiefly in the respiratory organs, and are characterised, unless when the reduction of temperature is remarkably great, or the air very moist, by reaction of the powers of life on the causes which excite them. Very warm states of the air impede the changes which the blood undergoes in the lungs; and, by thereby furnishing abundant materials for the formation of bile, occasion an increased secretion of this fluid. Hence bilious diseases are most prevalent during high atmospheric temperature. This effect upon the blood is still more marked, if warmth be conjoined with moisture (§ 34). Under those circumstances, bilious fevers, hepatic diseases, dysentery, diarrhoea, and cholera prevail.

33. (*b*) *Moisture*.—In dry states of the air, changes are fully effected on the blood by respiration; its watery portions are more freely carried off from the exhaling surfaces; its purity is increased, its congestion and excessive fulness prevented; and consequently, the vital energies are promoted; and the depressing causes of disease, as infectious animal effluvia, and terrestrial exhalations, make much less impression on the system. Disorders occurring in this state of air assume chiefly a phlogistic or sthenic character, and affect most frequently the organs of respiration and the nervous system. A very moist state of atmosphere causes opposite effects. It fails of producing to the full extent the requisite changes in the blood, and of carrying off the fluids exhaled from the surfaces, especially of the lungs; thereby rendering the powers of life more languid, and the system consequently more open to the invasion of the exciting causes. Less moisture, also, being exhaled, the elements of biliary secretion, and the watery portion of the blood become redundant in the vascular system. Hence an abundant secretion of bile, fevers, affections of the liver, and determination of fluids to the intestinal canal &c. are promoted. (See art. CLIMATE.)

34. (*c*) *Temperature and moisture conjoined*.—That warm and humid states of air are individually active as predisponents of disorder, has been shown; but it is when they are conjoined, that they are especially injurious. A warm and humid atmosphere dissolves and accumulates the specific causes, such as animal and vegetable effluvia; assists their operation; and favours a rapid transfer of electricity from the earth's surface, and the change in the condition and the accumulation of it in the air resulting therefrom. It has been shown by the experiments of PROUT, FRYFE, ALLEN, and PEPYS, in an artificially increased temperature, and by those I made in an intertropical atmosphere, that heat remarkably diminishes the changes effected by respiration on the blood; and these changes are further diminished by warmth associated with moisture, which, moreover, promotes the passage of positive electricity from the body. And as the researches of RITTER show that the

electricity of the positive pole heightens, whilst that of the negative depresses, the actions of life, the ultimate effect of humid atmospheric warmth, as respects both the state of the circulating fluid and the locomotive electricity of the body, will be to lower the whole circle of vital manifestations, and to dispose to, or even to induce, diseases of a low character—to occasion adynamic, continued, and remittent fevers, or agues of a pernicious and congestive kind, or dysentery, cholera, chronic asthma, diarrhoea, and affections of the liver and spleen. A moist and warm air may, therefore, be stated to be doubly injurious, inasmuch as it is of itself an extremely active predisposing and exciting cause, and as it is the means of dissolving vegetable and animal miasms,—of marsh, infectious, and pestiferous emanations,—and the vehicle or medium in which they act injuriously on the frame.

35. (d) *A moderately cold and a dry air increases the respiratory actions, and the energies of the system; proving what is commonly called a bracing atmosphere. Diseases usually assume an acute, sthenic, or phlogistic form; and the respiratory organs are liable to suffer.*—In cold and moist states of air, rheumatism, gout, nervous affections, scrofula, and glandular diseases, intermittent and adynamic fevers, erysipelas, dropsies, anasarca, and chronic disorders and congestions, often prevail, especially in low, ill-ventilated, and marshy places. The positive electricity being rapidly carried off by induction from the body, a salutary stimulus, and one which experiments have shown to be productive of increased activity of all the animal functions, may be supposed to be lost. But when the air is very dry, the transit of electricity from the surface of the earth and from the body is impeded; this fluid accumulating until a moister state of air diminishes its quantity, and changes the relation subsisting between the electrical condition of the frame and that of the atmosphere. In very dry and warm states of air diseases less frequently prevail than when it is both warm and moist; and are more frequently characterised by increased vascular action. Inflammatory fevers, inflammations of the brain, liver, and stomach, are then most prevalent.

36. (e) *Sol-lunar influence.*—Considerable importance has been attached to the influence of the sun and moon in creating a morbid predisposition. Close observation of the relation subsisting between the prevalence of fever and dysentery, and the full and change of the moon, has apparently established some degree of connection between them in warm climates, particularly in the eastern hemisphere; but the manner of explaining this circumstance has been by no means satisfactory. Some impute it to a direct lunar influence; and adduce in support of their opinion the fact, that dead animal matter, when exposed to the moon's rays, more speedily suffers decomposition than when protected from them. Others, who favour sol-lunar influence, argue that it proceeds from the height of the tides, at full and change of the moon, occasioning the rivers on the coasts to inundate their banks, and to deposit vegeto-animal matter, which is rapidly decomposed, when the water retires and leaves the low ground exposed to the sun's influence. But if the relation subsisting between the preva-

lence of disease, and the moon's changes were owing to this circumstance, it could hold only in respect of parts situated in the low alluvial countries on the coast, and not in districts inland and much elevated above the level of the sea. This, however, is not the case; for observation has shown the influence, whatever it may be, to be as powerful in high and inland countries as in districts on the sea-shore.

37. (f) *Light and sunshine.*—That the power of the sun's directed and refracted rays, in the production and removal of disease, is by no means inconsiderable, is proved by their influence on the vegetable and animal kingdoms; and by the effects which ensue in the economy when they are entirely excluded. These effects have been described in the articles on the BLOOD (§ 47.), and DEBILITY (§ 6. c.). The vital depression, attended by increased sensibility, mobility, and susceptibility to impressions, and the anæmia and general cachexy, which ultimately result from the protracted exclusion of light, are sufficient proofs of the beneficial influence of the sun's rays upon the frame. But additional and more direct evidence is furnished in the greater activity of the vital functions in spring; and in the genial excitement of the frame of the aged and debilitated, and indeed of both the minds and the bodies of all, by sunshine; light, as ordained and regulated by nature, being a salutary stimulus, and necessary to the energetic and healthy performance of all the functions. The exciting and depressing effects of the excess and absence of light respectively prove its influence over all the organic and mental manifestations, and consequently its power in predisposing to, and even exciting, disease—the intense or continued action of light inordinately exciting the nervous and vascular systems, and producing disorders of this kind; its abstraction weakening all the mental and bodily functions, and favouring the occurrence of diseases of debility. It is obvious from this, that light, especially sunshine—and even its abstraction—may be made subservient to the removal of disease, either in its individual capacity, or in association with a pure, dry, and temperate, or warm air, assisted by suitable exercise, and change of locality, and that the partial abstraction of one or both of these requisites to the due or energetic performance of the functions, must be ultimately followed by disease, however remote the effect, or numerous the intermediate links in the chain of causation.

38. ii. *THE EXCITING CAUSES.*—These have been called *occasional* by some writers, and *direct* by others, *determining* by several, and *principals* by a few writers. I shall divide this class of causes into—(a) those which are occasional in their operation; and (b) those which are specific, or whose influence is followed by specific and determinate results. The causes already described dispose the body to the action of those about to be noticed; either by impeding, modifying, or interrupting some one or more of the vital functions, or by changing the constitution or organisation of the tissues or organs which are the instruments of the functions under the dominion of life. But the predisposing causes may, either by their activity, or by their acting in combination or in close succession, of themselves, produce disease, without the aid of any of those which are

lation. All the depressing emotions of mind have an especial effect upon the circulation, upon the nutrition of the frame, and indeed upon all the functions dependent upon the organic nervous system; and favour chronic and asthenic diseases of the heart, particularly passive dilatation and enlargement of its cavities, indigestion, and constipation; also chlorosis, pulmonary consumption, hysteria, and tubercles, early in life; and hypochondriasis, melancholia, chronic diseases of the liver, spleen, and pancreas, and cancerous or other malignant diseases, at mature or advanced ages.—*δ*. Surprise, fright, terror, anger, and indignation, are not infrequently productive of apoplexy, paralysis, epilepsy, convulsions, syncope, violent palpitations, painful or acute affections of the heart, disorders of the stomach, liver, and bowels, hysteria, abortions, derangement of the uterine functions, and of the manifestations of mind.—*ε*. Great mental excitement, unlooked-for success, the sudden accession of fortune, extreme joy, and all the pleasurable emotions carried to excess, are not infrequent causes of insanity, of phrenitis, epileptic convulsions, hysteria, and catalepsy.—*ζ*. An improper conduct, and an insufficient control, not only of the sentiments and emotions, but also of the imagination, are amongst the most common causes of disorder in the manifestations of mind, as well as of the other maladies enumerated above (*α, β*).—*η*. Inordinate indulgence of the sexual appetite occasions epilepsy, loss of memory, and mental and corporeal debility, impotency, diseases of the testes, prostate gland, and urinary bladder, and affections of the heart and lungs in males; and in females, inflammation of the ovaria and uterus, fluor albus, hysteria, chlorosis, melancholy, irregular convulsions, organic or scirrhus changes in the uterus, diseases of the ovaria, and sterility, &c. (See art. AGE, § 24.)—*θ*. Persons who have been habituated to excessive sexual indulgence, and become altogether continent, are liable to nocturnal emissions, to impotency, convulsive and other nervous diseases, and to disordered mental manifestations.—*ι*. Numerous acts of volition injudiciously attempted or directed may be productive of the most dangerous injuries and disease; as violent muscular efforts, of sprains, aneurisms, hæmorrhages, inflammation and caries of the vertebræ, or inflammation of the intervertebral substances. Positions with the head low, or on the back, and especially such as are uneasy or unnatural, too long retained, or too frequently assumed, give rise to cerebral disorder and curvatures of the spine; and encumbered, obstructed, or too rapid and protracted movements, produce injurious acceleration of the circulation, exhaustion, with other ill effects.

54. *B. The chemical and mechanical causes of disease require little notice here; the former of these having received attention in the articles on ASPHYXY, and POISONS; and the latter on that of ARTS AND EMPLOYMENTS, as Causes of Disease.*—(*a*) *Chemical agents* are injurious—1st, by their influence on the functions of the part with which they come in contact, their effects varying with their individual properties; 2d, by the change they produce in the structure itself, either in combining with it, or otherwise changing its constitution, so as to render it incapable of its

healthy offices; and, 3d, by totally destroying the nervous and vital influence, and intimate organisation of the part.—(*b*) *Of mechanical causes* and positions impeding, upon physical principles, the flux or reflux of the circulation and secreted fluids, continued pressure of various grades, and unnatural ligatures of parts, are the most common, and act slowly, and often insensibly and unremittingly. Shocks or concussions of a part or of the whole of the body, or other kinds of external violence, not only occasion the division, fracture, dislocation, bruise, and comminution of external parts, but also the rupture, laceration, hæmorrhage, displacement, vital depression, or extinction of function of internal viscera, as of the urinary bladder, liver, spleen, stomach, and bowels, brain, spinal chord, &c.

55. *iii. THE SPECIFIC CAUSES OF DISEASE.*—Of the causes which may be thus termed, emanations from the soil are, perhaps, the most common.—*A*. The *miasmata* arising from stagnant water, partially covering the soil, or covered by vegetating substances; from vegetable matter in a state of decomposition; from moist absorbent soils exposed to the sun's rays; from the muddy and foul bottoms of lakes, marshes, and lagoons, or the marshy banks of rivers and canals; and from low grounds which have been partially inundated by the ocean or by rivers; are productive of agues, enlargements of the spleen, of the liver, and even of all the glands, of rheumatism, catarrh, &c., in cold or temperate climates; and in addition to these, of remittents, bilious and gastric fevers, dysentery, cholera, diarrhoea, and hepatitis, in warm climates and seasons, according to the predisposition of the patient, and the circumstances which have aided the action of the efficient cause on the system.

56. *B. When dead animal matters or exuvie mix with vegetable substances, and putrefy along with them, in a warm and moist air, the effluvia assume a more noxious form, especially if the air stagnates in the vicinity of its source; and it becomes more certainly productive of disease than that which proceeds from the decomposition of vegetable matter only; the effects produced by it being often of a more adynamic or malignant character. In warm countries, the localities enumerated above abound with dead animal bodies, and the exuvie of immense swarms of insects; and hence may be inferred the reason wherefore terrestrial emanations in these climates give rise to more severe forms of intermittent and remittent fevers, depress more remarkably the vital powers, derange more the vascular system, and more sensibly affect the blood and the secretions, than the miasmata exhaled from similar places in northern latitudes. The water of low, moist, and marshy places is also productive of various maladies, particularly of dysentery, chronic diarrhoea, diseases of the spleen, Guinea-worm, &c. These causes and effects, with what is at present known of their operation, are more fully discussed in the arts. ENDEMIC INFLUENCE, and FEVERS.*

57. *C. Emanations from animal matter only, the air being in other respects uncontaminated, or frequently renewed, are seldom productive of any serious maladies. But when they burst forth suddenly, in a close and moist air, the effects are sometimes most pernicious. It has been recorded, that fevers of a very malignant kind have attacked*

ment, until a change of weather—from dry to moist, &c.—or depressing mental impressions, or cold and fatigue, or venereal excesses, or in short, any debilitating influence, occur to aid its operation and determine its action; and if no such consecutive causes aid the principle or specific cause, in a few days from the exposure to it, disease will often not appear. I have frequently seen this exemplified in a very striking manner: one instance on a large scale will be sufficient. Between twenty and thirty persons were exposed all night, without cover, to the air of one of the most fatal sources of miasmata furnished by a warm climate, during the unhealthy season, but were soon afterwards removed to sea—far from any further exposure to this specific cause. They continued well for six or seven days, when about half their number experienced great fatigue. All these were nearly simultaneously—on the following day—seized with remittent fever; whilst those who had not been subjected to this consecutive cause, with the exception of two, who were not attacked till several days subsequently, entirely escaped, although all had been equally exposed to the specific cause of that form of fever. Further illustrations from my experience in different climates, and of various diseases might be adduced; but the simple statement of the above fact is sufficient. The practical importance of it, however, should not be overlooked; for it shows—what I have frequently believed has been successfully practised—namely, that a person who has been subjected to the impression of a specific or any other exciting cause, may escape its effects, if he immediately fortify the system against it, and avoid exposure, for some time subsequently, to all other injurious agents, especially those which lower the vital energies of the frame. Persons even who experience the sensations more immediately caused by exciting agents of a specific kind, as infectious emanations, will often escape by observing this precaution, and having recourse to a restorative regimen, with the usual means of promoting all the secreting and excreting functions of the frame, as shown in the art.

FEVER — Prophylactic Means.

62. It is unnecessary to enumerate the causes which most commonly come in aid of the exciting agents of disease. They comprise nearly all those already adduced as predisposing the system to, as well as occasionally exciting, morbid action; particularly such as depress vital power, by their specific properties and immediate impression; the abstraction of requisite or accustomed stimuli, as of warmth, food, &c.; whatever impedes the functions of respiration, digestion, assimilation, and excretion; all weakening discharges; depressing affections of mind, particularly fear of being affected by the cause to which the person was exposed; and all circumstances in any way deranging the accustomed tenor of the mind, and habits of life.

63. III. GENERAL DOCTRINE OF DISEASE, OR PATHOGENY (from *πάθος*, disease, and *γεννάν*, I gender, or produce).—An examination of the systems of medicine proposed since the revival of learning in Europe, or even of those advanced in modern times, would occupy more of my limits than I could devote to the subject. I shall, therefore, proceed at once to the development of those general views of disease, which observ-

ation and reflection have suggested to me, and convinced me to be of importance, not only in estimating aright the exact state of the more common specific maladies, but in forming safe opinions respecting those more anomalous or complicated affections, which frequently present themselves to the practitioner.

64. I have already contended (§ 7.), that, with few exceptions, which have been particularised, the causes of disease *first* modify the manifestations of *life* in some one or more of the systems and organs with which it is allied; or, in other words, first disorder the functions with which they have a direct relation; and that, after a period of longer or shorter duration, the disorder of function becomes a cause of further disorder in related or associated organs, and ultimately, if circumstances obtain hereafter to be noticed, of change of structure either in the primary seat of disorder, or in that consecutively affected. From this, and what has been already stated, it will appear that a great proportion—nay, all—of those disorders of internal parts which have been viewed as *intrinsic* predisposing and exciting causes of disease, are, in truth, pathological conditions, or existing states of disease, induced by some one or more of the causes specified above, and ready to produce further disease, or to lead on to a salutary change, according as the existing state of vital power or resistance, and the influences or agents acting on it, may determine the procession of phenomena, or incline the balance. These primary or early changes, or morbid conditions, may very aptly be termed *secondary* or *pathological* causes, when they give rise to ulterior change either of function or structure; but they are so diversified, that but little notice can be taken of them here, beyond what is necessary to the consideration of general principles; their different forms being more intimately viewed in the articles on specific diseases. It may, however, be remarked that they often exist in latent, or almost imperceptible, states, and predispose the frame to the invasion of causes to which it otherwise might have been exposed with impunity.

65. The great fault of all systems of pathology, down even to the most recent has been their confined or narrow principles, and consequently their inadequacy to the explanation of all the states of morbid action constantly occurring. Brown and his followers admitted but two modifications of the vital manifestations from the normal state, viz. depression and excitement, whilst he substituted an inappropriate and single term as a sign for those manifestations, which are as obviously and frequently changed in kind as in degree. Dr. PARRY referred the chief states of disease to the vascular system and to changes in its states of action, without sufficient reference to the nervous system, as controlling and even causing these changes, especially to the organic nervous system, with which the vascular is so intimately connected; whilst his contemporaries, who considered that disease originates in the nervous, and affects the vascular, system consecutively, viewed the cerebro-spinal axis, and its various prolongations in the form of nerves of sensation and volition, as the parts primarily impressed. Considering, however, as stated in the article on DEBILITY (§ 13.), that the intimate association of the organic nervous system with

69. *B. Of excitement and reaction.* — No circumstance has tended more to prevent the acquisition of sound principles in pathology than the terms introduced by BROWN and his followers, and the meaning attached to them. Indeed, it was a matter of no small difficulty to arrive at a precise idea of what meaning they did convey; for a single word was in itself an hypothesis; and "*excitability*" — accumulated, exhausted, &c. — "*sensibility*," "*susceptibility*," &c. were made to perform more than actually falls to their lot. As, however, these terms are frequently employed in medicine, and cannot now be conveniently discarded, it will be as well to state the idea that should be attached to them. *Sensibility* is the faculty of receiving impressions, and of being conscious of them. *Excitability*, the power of being excited by stimuli or irritants, whether consciousness attend the act or not; consciousness generally following their application to organs of sensation and volition, or of animal life; but not when applied to those of involuntary motion, or of vegetative life, unless the excitation be carried to a great height. *Susceptibility* is the power not only of receiving impressions, but of being affected by them, whether the agents be physical or moral, and whatever may be their mode of operation; consciousness either attending or not attending the act, according to the nature of the agent, and the organ it affects. Here it will be perceived, that *sensibility* implies a certain faculty; *excitability* the power of acting only in one direction; and *susceptibility* of being affected in every way, according to the nature of the cause; and that the meanings are the same, whether these terms be applied to a single organ or to the whole frame; they representing intimately allied manifestations of life in organised parts. The states, moreover, which these terms represent, are variously modified in different persons, according to temperament and constitution; but they are still more remarkably altered by the causes enumerated above, as well as by the successive changes characterising diseases; and hence they become important signs of the condition of vital power, and of the progress of functional and organic change. When existing in a very manifest or extreme degree, they are of themselves important pathological states, and in this respect they deserve notice.

70. *Sensibility, excitability, and susceptibility*, are great or especially prominent in delicate, debilitated, nervous, and irritable persons, and are morbidly increased by whatever lowers the general amount of vital power, if the functions of the brain be not impeded, or by excited action in any part of the cerebro-spinal axis not attended by pressure. They are much less lively in the robust, lymphatic, and phlegmatic constitutions; and are more or less diminished in congestive diseases, particularly those of the brain; in many cases of vital exhaustion, when the blood becomes contaminated; or when pressure takes place in any part of the cerebro-spinal centres or prolongations. They are likewise temporarily or permanently impaired by the intense, frequent, or continued impression or action of the same impressions; and are restored or heightened by the abstraction of those which are of a lively or intense kind. Although *excitability* is easily and

quickly roused in the delicate and nervous frame, and in states of simple debility, as specified above, yet it is more rapidly exhausted or altogether extinguished; whilst, on the other hand, it is much less readily brought into action in the robust; but when once roused, it is either more energetic or longer sustained than in the debilitated. In these states of disease, which I have denominated secondary and complicated debility, and especially when the cerebro-spinal centres are congested or pressed upon, or when the circulating fluid becomes contaminated, the excitability is either much diminished or altogether lost, — chiefly, however, as respects voluntary organs, when the nervous system of animal life is affected; involuntary parts still admitting of excitation, although not so readily as in health. *Susceptibility*, even more remarkably than the two other powers, is increased by debility and novelty of impression, and diminished by a robust and due manifestation of vital power; by a repetition of the same effect, whether it be stimulant or depriment, unless each succeeding application of the same agent be made before that of its antecedent had altogether ceased; as evinced by both the causes of disease and the operation of stimulating and narcotic remedies. The complete manner in which the susceptibility to be affected by certain causes of disease is destroyed by their full and adequate action, is shown by several of the specific agents.

71. *Excitement* may be of two kinds, according to the manner of its occurrence: it may directly follow the impression of the exciting or irritating cause, in which case it is *primary or direct*; or it may follow as a more or less remote effect of agents which lower the action either of a part or of the frame throughout, when it constitutes what is called *secondary, or reaction*, as in the case of the vascular excitement following the application of severe cold to a part, or the whole, of the external surface. It is necessary to distinguish between these two grand conditions or manifestations of excitement; for the secondary, or that following indirectly the impression of lowering or sedative agents, may be variously modified throughout by the nature of the primary impression, and its mode of action. Hence one cause for the distinction here made. There are, besides, numerous other modifications of excitement, whether primary or secondary, referrible to the nature of the agent, and the parts of the body on which they have directly acted. The excitement caused by mental emotions is different in its progress, duration, and consequences, from that following the ingestion of spirituous or other stimuli; and this latter, and indeed both, are different from the increased action following sympathetically the irritation of some organ or viscus. In the *first*, the cerebro-nervous and vascular systems are simply excited, the excitement terminating in slight exhaustion, unless some part has been injured during its continuance. In the *second*, these systems are more than simply excited. A more manifest febrile state continues for some time subsequently, with concomitant lesion of the digestive functions or viscera, owing to the passage of a portion of the morbid agent into the circulation, and to the more immediate lesion experienced by the parts on which it made its primary impression. In

the third, the excitement is more especially expressed in the organic nervous and vascular systems—the chief factors of life—owing to its extension to the whole of these systems, from the part in which it originated, and still exists: hence its duration depends upon the primary lesion, and there is, in addition to the general or sympathetic excitement, disordered function of the part primarily affected, as well as of those more intimately allied to it. Even from what has now been stated will appear the importance, in pathological and therapeutical points of view, of instituting a comprehensive analysis of those states of vital action to which the term excitement has been applied, and which bears a very wide and often indefinite signification.

72. (a) *Primary or direct excitement* is one of the most frequent effects produced by the agents which surround the body. It may proceed from such only as are external to the frame, and to the part which it excites, or from such as are internal or intrinsic. Its phenomena and consequences vary as it arises from causes acting chiefly upon the organic nervous and vascular systems, and their immediately related organs—upon the organs and functions of organic life—and affecting them principally; or from such as act primarily upon the cerebro-spinal system, and organs of animal life, as those of sensation, reflection, volition, contractility, &c. But the modifications which spring from other sources, especially from the properties of the agent, the intensity of its operation, and the number of parts affected by it, are too numerous for a superficial view, even if the knowledge requisite to the attempt were attained. I must therefore content myself with noticing merely a few of the more prominent features of this condition of life.

73. a. *Excitement of the systems and organs of vegetative life* gives rise to various changes and phenomena, according to the nature of the impression, and its intensity.—Gentle excitation of the *digestive canal* increases the tone or insensible contractility not only of it, but also of all the circulating system, of the hollow viscera, and of fibrous or muscular parts. If the stimulus be considerably greater, either the same effect is produced, or the excitement is concentrated in the digestive viscera, and proportionately withdrawn from other parts. If the excitement be still greater, and be of a kind that irritates the villous surface, the secretions of this surface are augmented, and the muscular coats of the canal roused to more or less energetic action, followed by the excretion of their contents.

74. *Excitement of the vascular system* is generally a consequence of stimuli applied to the digestive surface, of irritation of any kind affecting the tissues, of local inflammation, of stimulating substances conveyed into the current of the circulation, of muscular exertion, and of the lively mental emotions, directly increasing the heart's action. The grade, duration, and effects of excitement originating in this system, vary with the cause and the state of the body at the time. Its gentlest, and, at the same time, most permanent, form is caused by the action of a pure, dry, and temperate atmosphere on the blood circulating in the lungs; whilst the most tumultuous and the most injurious, as respects its effects on the heart

and blood-vessels, on the blood itself, and on the functions of vital organs, is that produced by inordinate or continued muscular exertion; and by the absorption of various stimulating and irritating substances into the blood. Violent exercise affects the crasis of the circulating fluid (see BLOOD, § 134.), causes its irruption through the capillary canals of soft and yielding tissue, as the mucous surfaces and the parenchyma of the viscera, induces inflammation of the heart and arteries, and excites similar disease in predisposed organs. Irritating or exciting substances conveyed into the blood, inflame the internal surface of the heart and arteries, alter the condition of this fluid, occasion various acute and chronic diseases of the vessels (see arts. ANEURISM, HEART, and VEINS), and often severely affect the functions of secreting and excreting viscera, inordinately exciting or inflaming those deparative organs which carry them out of the system.

75. The *portal circulation*, and the liver, to which it is distributed, may be especially excited, owing to the quantity of stimulating morbid, effete, or foreign matters carried into, or generated in, the blood which is returned from the digestive canal and other abdominal viscera. These may not only inflame the portal vessels, but also the substance of the liver; or, when the materials and elements of these vessels are of a less irritating kind, may give rise to morbidly increased secretion of bile, or to various organic changes and adventitious formations in this vessel.

76. The *absorbent system* is seldom or never co-existently excited with the arterial system. Indeed, inordinately increased vascular action is generally attended by a proportionate inactivity of the absorbents—both lymphatic and lacteal. Whilst it is frequently observable that a weak action of the arterial is accompanied with great activity of the absorbent system. It would seem as if diminished organic action, or that state resulting from an insufficient exertion of the organic nervous influence on the arterial and capillary systems—the chief source of nutrition, structural cohesion, and other vital manifestations—leaves, in consequence of the animal molecules being then held together by a weaker attraction than in an opposite state of this influence, a greater proportion of effete materials, by which the absorbent vessels are excited to increased action.

77. *Excitement of involuntary muscular parts* is characterised by spasmodic contraction of either a permanent or alternating clonic kind—or rather of the various intermediate states between sthenic and asthenic, as marking the extremes—and is generally occasioned by irritants of the surface covering the hollow vessels, and more rarely by direct excitation of the nerves supplying them, and by morbid states of the blood, affecting either them or the nerve supplying them. The asthenic or clonic form of spasm is most commonly associated with exhausted vital power, or an impure state of the circulating and secreted fluids, the excitability of these structures being more easily acted upon in weak than in robust frames; and hence, when in action, is more rarely conjoined with excitation than with debility of other organs. It would seem that, in most spasmodic disorders, the excitement necessary to this state of action consists in the concentration of an undue proportion of the

power in the nerves supplying the affected muscles, and in the muscles themselves, and a proportionate abstraction of it from other parts; and that when the excitability of an unaffected structure or viscus is energetically roused, the pre-existing morbid excitement will be derived from, or subside in, the parts in which it was seated.

78. The excitement of *secreting viscera and glands* presents various modifications and grades, according to the cause which induced it, and the elementary system especially affected. If the organic nerves supplying them be chiefly excited, the special functions they perform will be augmented—their secretions will be abundant. In this case the excitement will be more particularly limited to the organs whose excitability has been acted upon; the morbid condition consisting chiefly of a concentration of vital manifestation or action in them and derivation of it from other viscera, thus occasioning one of the forms of *Debility* specified in that article (§ 8, 9.), the increased secretion generally preventing the occurrence of febrile commotion or acute sympathetic disorder, unless it be carried very far. But when the excitement is seated principally in the blood-vessels, and assumes the form of inflammation, the specific function of the secreting surface or organ will be variously altered; the fluid elaborated, in this case, by a secreting surface, being either increased or quite changed from the natural state, or both, according to the degree and form of the excited vascular action with which it is affected; and that secreted by glandular structures being also either much altered, diminished, or entirely suppressed, as in cases of inflammation of the kidneys, salivary glands, &c.; this form of excitement not giving rise to the state of vital concentration observed in respect of the former, but frequently to general or sympathetic febrile commotion. Excitement of secreting viscera, then, assumes two forms, viz. that affecting chiefly the organic nerves—the *excitement of irritation*, which is always attended by augmented secretion, and increased determination of the circulation to the part thus affected, but not necessarily by true inflammation, although this may follow; and that affecting the arteries and capillaries—the *excitement of inflammation*, which is accompanied with altered secretion, always in kind and frequently in quantity,—the quantity being often increased in mucous surfaces, and remarkably diminished from glandular organs.

79. The excitement of the *generative organs* may proceed from the accumulation and irritation of their proper secretions, from mental emotions, and from the excitation of adjoining and related parts, as when the rectum or urinary bladder is stimulated. It is, more especially at its commencement, a purely nervous change; the nerves of organic life which chiefly supply these organs being excited, either through the medium of the brain and sensorium, or in a direct manner, and as above stated. There is no part of the economy which furnishes so evident a proof as this does of the influence of the organic nerves upon the local or general circulation; their excitation being here shown to be followed, unless the susceptibility and excitability be entirely exhausted, by increased determination, vascular action, and vital expansion of the tissues; irritation of this class of nerves evidently deter-

mining also in other parts of the body, particularly in mucous glandular and cellular structures, as well as in these organs, increased flux of blood, and occasioning the turgidity or vital expansion of the vascular canals running between the extremities of the arteries and the radicles of the veins. The influence of sexual excitement upon all the other functions, especially at the period of puberty, and subsequently; its sympathetic action on the rest of the nervous system giving rise to various disorders, particularly to the numerous forms of hysteria, anomalous convulsions, epilepsy, catalepsy, &c.; and its more direct operation in producing menorrhagia, fluor albus, inflammatory and organic changes of the ovaria and uterus, besides other disorders in both sexes, more especially referrible to premature, too frequently repeated, or too excessive stimulation, and consequent exhaustion of the excitability of those organs; are circumstances familiar to the practitioner.

80. *β. Excitement of the organs of animal life* may arise from intrinsic or organic changes, as from the condition of the organic nerves and vessels distributed to them, or of the blood itself; or from causes affecting the instruments of sensation, the general sensibility of the frame, or any of the mental manifestations; or from those which excite to mental or physical exertion. Intrinsic changes may occur in the organic nerves and vessels, influencing the circulation through the brain, without any very obvious cause; and these may be such as will excite not only this part, but all others depending upon it for their functions. It is more than probable, that with the brain, as with other viscera, the excitation may be seated chiefly in the organic nerves distributed to it, and hence assume more of an irritative state, or of an exaltation of function, without any particular lesion, as when it is simply excited by vinous or spirituous liquors: or the excitement may extend to, and principally affect the blood-vessels; giving rise, according to its degree, to certain states of inflammatory action, and to general febrile commotion, with more or less lesion of function. It is almost unnecessary to observe that either of those forms of excitement, related as now explained, or both of them coëtaneously, may originate in the exercise of those faculties, of which this organ is the instrument under the endowment of life. It often falls to the physician to trace the progress of excitement in relation to the brain, from the lively exercise of function characterising talent and genius, into exaltations, approaching to morbid, of one or more of the mental manifestations; and next, into inflammatory action or mania; and lastly, into a state indicating mental collapse, or structural change. The influence, particularly in susceptible persons, of lively or of violent impressions upon the instruments of sensation, in exciting the nervous centres, with which these instruments are in constant communication, is shown, not only by the effects of loud noises, and of a strong light, but also by violent or painful stimulation of any portion of the sentient system distributed throughout the frame. The sympathetic operation of external injuries, of extensive burns or scalds, of long-sustained or suppressed pain and sufferings, in exciting an irritative state of the cerebro-spinal axis and its membranes, in increasing their vascularity, and even in giving

rise to effusion, with the related phenomena of delirium, tremefaciens, mania, general febrile action, or convulsions, is not the less true or important, from its being overlooked, and the exact seat and nature of the consecutive suffering, as well as the more immediate cause of death, being misunderstood.

81. Excitement of the *voluntary muscles and locomotive organs* takes place either from volition, or from causes acting in opposition to it. Exercise promotes the synovial secretions, and the developement of the muscular structures and of their energies. But long-continued exertion increases the flux of blood to the related parts of the cerebro-spinal axis, and to the muscles themselves. The morbid excitement, however, of voluntary muscles, which removes them out of the control of the will, has never been satisfactorily explained. Their more asthenic, or clonic anormal actions, which have been usually denominated convulsions, have been frequently traced to obvious lesion in the brain; but they have likewise been as truly referred to causes seated in the *prima via*, irritating the organic nerves, and, through them, the voluntary nerves. The almost universal state of asthenic spasm, called tetanus, has been ascribed to inflammatory excitement of the arachnoid and other membranes of the spinal chord, from the circumstance of its having been detected in several cases, and by myself in two instances. But this change is as probably a consequence of the muscular excitation, as the cause of it. How, then, does this state of muscular action originate? The answer is not easy. But when we consider the connection — anatomically and physiologically — subsisting between the muscular, the voluntary nervous, and the organic nervous, systems, the reasons wherefore irritants acting on either of the latter will affect the former, or those affecting the muscles themselves, or even their tendons, will, in certain circumstances, through the medium of the nervous systems, excite general muscular contractions of a permanent or recurring kind, will not appear so far beyond our comprehension. If we connect the causes of these affections with the earlier phenomena, we shall generally find, even when the exciting agent has acted on an external part, that the organic or sympathetic nerves have been thereby irritated; and that, owing to their influence on the voluntary nerves, a state of spastic action is kept up in the voluntary muscles, or recurs in them at intervals, the brain itself being affected only in those cases which present lesions of its functions. This opinion, published by me in 1821, subsequent experience — pathological and therapeutical — has confirmed, particularly in respect of those cases in which the brain is free from disease. (See *arts. CONVULSIONS, TETANUS.*) It follows, therefore, as corollaries from the foregoing, that whatever irritates the voluntary nervous system, or makes an extraordinary demand upon its influence, or any of its functions, will excite it, in that part especially upon which the particular influence or function called into operation depends, or with which the part principally acted on is in communication; and will determine to it an increased flow of blood, which may, in certain circumstances, go on to inflammation or structural change; and that irritation propagated to the voluntary nerves will so express itself

upon the muscles they supply as to give rise to various states of spastic action, according as it originates in the sympathetic nerves, or in the brain, or is connected with other change, functional or structural. Thus, mental exertion excites and determines the circulation to the head, muscular exertion to the spinal chord; and local irritation occasionally gives rise, through the medium of the organic and voluntary nervous systems, to spasmodic action of the muscles of volition, of either a remittent, intermittent, or continued form.

82. (b) *Secondary or indirect excitement, or reaction*, is that state of increased function or functions following the impression of causes of a depressing or sedative kind: as when the power of life, having been for an indefinite time more or less lowered by cold, by terrestrial emanations, or by the effluvium from the sick, react upon the state of depression, and give rise to various phenomena characterised by excitement, which thus becomes one of the terminations of direct Debility (see that article). Great diversity of opinion has existed as to the way in which the economy reacts upon injurious and depressing agents. The *vis medicatrix nature*, vital resistance, the conservative powers of life, with other terms, have been substituted as explanations of what admits not of explanation, either by name, however expressive they may be, or by any other means. We can merely express what appears to be a law of nature, and describe certain resulting phenomena. We believe that the organisation is built up and kept together by the real and intimate alliance of life, and that this principle or endowment may be modified by changes in the structures, the instruments of its functions — that, in short, so intimate is the union of life with all the organs and tissues, that it is constantly influencing them, according to its varying states, and being itself influenced by them, as they become changed, both in respect of its local alliances and its general condition. And as that we can know respecting *vital resistance or reaction* must resolve itself into the general references, viz. 1st, That the innate powers of the vital principle, and the intimacy of its union with its material instruments, are such that it opposes, by means of these alliances — by its manifestations throughout the organisation, and by the mutual dependence and reciprocative influence — and by the manner in which it is influenced or modified by changes in its allied organs, — impressions of an injurious nature, the intensity of which is not so great as immediately to dissolve its connection with the structures, or at once to overwhelm its energies; and that, whilst it thereby resists the further progress of change, it at the same time restores that which has been induced, these phenomena constituting what has been called *vital resistance*: 2d, That when the morbid impression is energetic, a succession of changes generally follow in some part of the economy, owing to the circumstances now adduced, calculated to remove the primary impression, and its more immediate effects, to recover the lost balance of vital action, and to restore the interrupted or interrupted functions, — to these changes the terms *reaction* and *secondary excitement* have been applied; which, however, may be variously modified, in form as well as in degree and duration.

tains in the robust. In the phlegmatic, lymphatic, and cachectic constitution, it is excited less perfectly and with greater difficulty, and often assumes a modified form, particularly as respects its terminations. When excitement arises *directly* from a cause that is constantly present, as when an irritating body is lodged in the intestines, or in any of the tissues, it generally is continued, sometimes remittent, and of long duration; but when it occurs *indirectly*, or from a depressing cause, it may be either imperfect, or of short duration, the consequent exhaustion being great. This is evinced by diseases arising from malaria; reaction being less perfect, and vital depression with its effects more remarkable, when the cause continues to operate, owing to the residence of the patient in the locality which generates it. Excitement is, moreover, *modified* by states of the air—humidity lowering it, and a dry, pure air developing it—by mental emotions, by the condition of the circulating fluid as respects purity, and by previous health and habits. How these will influence the occurrence and course either of primary excitement or of reaction, is evident. The state of the vascular system as to fulness has also a great influence upon both: *plethora* favours local excitement and determination; whilst, when very great, it prevents the free developement of reaction, and disposes to dangerous internal congestions in circumstances that would have otherwise induced a free and salutary reaction. The condition of the *secretions*, also, has a marked influence in the production and duration of increased vital action. The accumulation of morbid secretions in the *prima via* or in the biliary apparatus may either impede the occurrence, or shorten the duration, of excitement; or may determine it more especially to these parts. The state of the circulating fluid itself, particularly in respect of *purity*, will mainly influence this manifestation of vital power. If it contain stimulating elements in excess, reaction will be rapidly and strongly developed. But if materials of an opposite kind be carried into or developed in it, neither primary nor secondary excitement may at all appear; the conditions of life throughout the structures being thereby depressed and modified, and the living solids ultimately rendered unfit for the performance of their functions.

86. *D. The consequences and terminations of excitement, primary or secondary.*—(a) The consequences of excitement are—1st, Various morbid productions or plastic formations, capable of organisation in certain situations, particularly when the vascular system has been affected in a sub-acute form; as the formation of coagulable lymph, and albuminous exudations in the form of false membranes, &c.;—2d, The exudation of sanguineous, or sero-sanguineous, or muco-albuminous fluids; as in cases of acute irritation of mucous surfaces;—3d, The production of various changes in the structures (see INFLAMMATION), and adventitious formations.—(b) The terminations of excitement are varied according to the system or tissue principally affected, the nature of the cause, and the concurrent circumstances. It has been stated as a general axiom, that excitement terminates in *exhaustion*, the degree of which is proportionate to the height to which the former had been carried. But there are numerous exceptions

to this, especially as respects reaction; which may be very slight, and yet the exhaustion may be extreme. The nature of the chief cause, numerous influences connected with the constitution of the patient, the surrounding media, and the mental affections, will modify the results.—
a. Excitement, in any of its forms, may gradually subside into a slight and chronic grade, which it may give rise to certain changes in the nutrition or secretions of the tissues affected; to morbid depositions, and effusions in shut cavities or the parenchyma of organs; or to increased secretions from mucous and glandular parts.—
β. It may also pass more rapidly into exhaustion expressed more especially either in one of the nervous systems, or in the capillary and vascular system, or in the absorbent system, according as one or other of these had been principally diseased. (As to the effects of exhaustion on the different functions, organs, and structures, see the article on DEBILITY, § 10—25.)

87. 2d. OF PERVERTED STATES OF VITAL POWER.—Having considered the simpler changes of the conditions of life, as manifested in the functions and characterising disease, those which are more complicated are next to be discussed; and it remains to be shown, that the conditions and material alliances of life may not only be changed in degree, but also in kind—the change in kind being, in some cases, unconnected with either excess or defect of action; and, in others, associated with the one or the other; but more frequently with depression, or an irregular distribution of the vital energies, and concentration of them towards particular parts. The conditions of life present three states or stages of change in kind, without any reference to degrees of action:—1st, Modifications in function, or vital manifestation, the proper offices of the part being vitiated but the structure not being sensibly changed. 2d, Modifications of function, in connection with change in the constitution of the part; the natural tissues having been metamorphosed by alteration of their nutrition or secretions, and by adventitious formations. 3d, Modifications of function and organisation in several parts, or of the whole of the frame; generally attended by vitiation of the circulating fluids.

88. A. The conditions of life may be modified in kind, without any visible alteration of structure. This state is often the commencement of others now particularised; but it also frequently proceeds no further, or one form of it may merely pass into another, or terminate in health. In slighter grades are more especially seated in the moving powers; the organic and cerebro-spinal nervous influences, and the vital properties of contractile parts, being chiefly affected; presenting, accordingly, a great variety of morbid phenomena, not strictly referrible to either excitement or debility, but consisting chiefly of alterations of the sensibility of these systems; of pain and spasm in their numerous forms; of cerebral affections and disordered mental manifestations; of lesions of the contractile and locomotive organs; of modifications of the sensible and insensible contractile parts, of their susceptibility and excitability, and of many changes in the state of the secretions and excretions, independently of those that relate to quantity. In its more exquisite and widely diffused forms, this state proceeds from

vancing slowly to the condition now being considered, as carcinomatous and their allied diseases; or taking place in a more rapid and violent form, as malignant or adynamic fevers, the effects of animal poisons, &c. It would seem that all deteriorations of the conditions of life are either consequences of, or otherwise related to, depression of them. If we trace the progress of those maladies in which the change in kind is the most conspicuous, we shall find that vital depression is a characteristic of the impression of their exciting causes, even although these causes may also irritate the vascular system, or impart irritating properties to the circulating fluids; for extreme depression of the manifestations of life — of its conservative and restorative properties especially — is frequently conjoined with an apparently high, and, as respects rapidity of action, extreme vascular excitement. When great depression is the attendant upon vital and structural deteriorations, the sensible properties of the circulating fluid and of the tissues — the crisis of the one, and the vital cohesion of the other — experience rapidly progressive changes, until the bond of union between life and structure is dissolved: alterations of a very conspicuous kind taking place in various parts of the body some time before death. (See article *DEBILITY*, § 11. 26.)

92. (b) The excitement which is sometimes associated with an alteration of the conditions and material alliances of life is essentially morbid, and is different from that which attends an otherwise unchanged or non-deteriorated state of the vital powers. This morbid excitement is generally expressed in particular systems and organs; the vital actions of the rest of the frame being proportionately lowered; but, whether it affect chiefly the nervous or the vascular systems, or take place primarily or consecutively, it soon terminates in profound exhaustion, and in a more or less complete vitiation of the conditions and alliances of life. This is illustrated by the advanced states of adynamic and epidemic fevers, by plague, &c. in an extreme degree; and by the worst forms of erysipelas and eruptive fevers in a less conspicuous manner. The excitement thus associated with other vital and material alterations, may proceed directly from its efficient cause, which may excite or irritate, whilst it otherwise affects, the organic nervous and vascular systems; or it may take place indirectly, or consecutively on depression, and be more or less a state of reaction, developed by changes in the circulating fluids, arising either from the absorption of irritating materials, or the uninterrupted elimination of hurtful elements. But in either case a progressive deterioration is observed; the morbid conditions of life affect the secreting and excreting functions, and consecutively vitiate the circulating fluids, and even the living solids: and the irritating or vitiated state of the former excites the vascular system; and thus alterations of the one reciprocally increase those of the others, either until the alliance of life with the structures can no longer be preserved, or until, in consequence of the exhaustion of the vascular action, which had been excited by the changes in the circulating fluid, and of the effects of this fluid on the secreting and excreting organs, the balance of vital excitement is inclined in their favour, a new action takes place, their functions are resumed,

morbid matters are thereby eliminated from the system, and health is ultimately restored; the change being either ushered in by critical phenomena, or promoted by remedies, the operations of which are merely an artificial or substituted crisis. (See art. *CRISIS*.)

93. IV. DISEASE OF THE FLUIDS AND SOLIDS, ORIGINATING IN ALTERED CONDITIONS OF LIFE, AND GENERALLY IN THOSE ALREADY DISCUSSED. — Morbid exhalation, secretion, and nutrition may be viewed as stages of the same organic action; exhalation passing into secretion, and secretion into nutrition. Thus we perceive the natural exhalations, during disease, assume the characters of a secreted or elaborated fluid, and certain morbid secretions become more or less organised. I shall therefore notice — 1st, The simpler changes of exhalation and secretion; 2d, Simple modifications of nutrition; 3d, Preternatural exhalation and secretion, comprising the transformations and misplacements of the fluids; 4th, Preternatural or metamorphosed nutrition; 5th, Adventitious formations, or productions, foreign to the economy — consisting of secretions — (a) insusceptible, and (b) susceptible, of organisation; and, 6th, Of destruction of parts.

94. I. THE SIMPLER ALTERATIONS OF EXHALATION AND SECRETION. — I have considered in distinct articles, on account of their great importance, morbid states of the BLOOD, and CONGESTIONS of this fluid. I shall here briefly notice changes in the exhalations and secretions. — A. The exhalations into shut cavities, or in the areolæ of the cellular tissue, may be increased from the following changes: — 1st, From deficient tone, referring either to the exhaling vessels and pores, or to imperfect vital cohesion of the tissues, or to both. 2d, From deficient action of the absorbents, depending on diminished vital power, or on obstructions in their course: 3d, From increased determination of blood in the vessels distributed to these parts: 4th, From inflammatory action terminating in, or being followed by, effusion: 5th, From obstructed and retarded circulation of the venous blood returning from these places, particularly in the liver, in the heart, lungs, &c.: the consequent nervous and capillary distension favouring augmented exhalation: 6th, From increased vascular or rather serous plethora, owing to the obstruction of some emunctory, — as anasarca, from the sudden arrest of the cutaneous and pulmonary exhalations; and this, as well as other forms of dropsy, from inflammatory or structural disease of the kidneys: 7th, From the sudden arrest of an accustomed discharge from the pulmonary or digestive mucous surfaces, the morbid exhalation being determined to the contiguous serous surfaces; and 8th, From two or more of the foregoing states conjoined. (See art. *DROPSY*.)

95. B. Alterations of the secretions depend — 1st, upon the state of the organic nervous influence; 2dly, upon vascular action; and, 3dly, upon the condition of the blood itself — upon the chief factors of organic action and life; and they are thus indications of the manifestations of this principle. They may be — α . more or less diminished, — as from causes which lower the organic nervous influence, or retard the circulation; β . or more or less increased, chiefly from agents which alter the distribution or determination of organic influence, and consequently of

the circulation and vascular action, either by exciting the secreting structures themselves, and their intimately allied parts, or by depressing, impeding, or obstructing the functions of distant and especially of other secreting organs, and from a superabundance in the blood of the elements of which the increased secretion is formed; *γ.* or more or less *altered* from the healthy state, independently of diminution or increase of quantity,—as when the conditions of life are modified otherwise than in grade, and when the circulating fluid is vitiated, either generally, or merely in respect of the greater abundance of some one element; *δ.* or both *diminished* in quantity and *altered* in quality, owing chiefly to lowered as well as modified vital power, to changes in the blood, and to morbid vascular action or inflammation of the secreting organ; *ε.* or lastly, they may be both *increased* and *vitiated*, either from a morbid distribution, and alteration of vital influence and action owing to the impression of causes on remote but related organs, or from irritation or excitement of the nervous influence of the secreting structure itself, by agents acting either exteriorly to the vessels, or interiorly through the medium of the blood. Thus, various substances received into the digestive canal will increase and alter the secretions of its mucous surface; and the accumulation of the elements of bile in the blood, with other effete matters, will excite the liver, and give rise to an abundant as well as acrid or otherwise morbid bile. Such seem to be the chief *pathological states* on which morbid secretions depend.

96. From what has been stated, it will be evident that, although alterations of the secretions are often dependent upon vascular action in its various states, from augmented determination to inflammation and its results, and upon conditions of the blood, organic nervous influence has also a marked effect in generating them, and even in originating the vascular disturbances to which they have been most generally assigned by authors. And although the secretions are constantly and conspicuously disordered in fevers and inflammations, yet they are also often remarkably altered in other diseases; and, in some, even constitute the most prominent change from the healthy state. In fevers and inflammations, the secretions are more acutely affected, but are more disposed to a spontaneous and salutary change, than in chronic disorders. In those maladies in which their alterations form the chief pathological state, their natural conditions are very slowly restored; and, even when the restoration is effected, their derangement is apt to recur from the slightest causes. This is exemplified in diarrhoea, diabetes, and several other chronic diseases.

97. (a) The *recrementitious*, as the salivary, pancreatic, and gastric secretions; or the partly recrementitious and excrementitious, as the biliary and intestinal secretions; are more or less altered in most diseases, and from a diversity of causes. Agents, whose operations may be sufficient to excite the organic nerves, but not to produce inflammatory action; or whose properties are calculated to affect the influence of these nerves, rather than the action of the capillary vessels; may give rise to an increase or other change of the secretions in preference to inflammation.

Thus, aromatics and stimulants will excite the flow of the gastric juices, but will not occasion inflammation unless taken in very large quantities; various substances will increase the intestinal secretions, but not inflame the villous surface; and mercury, in small or moderate doses, will remarkably augment the salivary fluid, but, in excessive doses, will inflame the glands and diminish the secretion. The effects of stimulants upon parts related or contiguous to those to which they are applied, also show the influence of the nerves on the secretions,—as the action of certain odours and savours on the salivary and gastric secretions, and of various purgatives on the biliary fluid. Even mental emotions affect the secretions through the medium of the related organic nerves supplying secreting structures; and this effect is not limited to the recrementitious fluids, but is also extended to those which are entirely excrementitious, as the urine, the sweat, &c. The influence of mental anxiety in producing both diuresis and enuresis, and of hysteria in occasioning the former, is well known. Deficiency of the recrementitious fluids causes dyspeptic, hypochondriacal, and other diseases of the digestive organs; impedes or otherwise modifies sanguification and nutrition; and favours the production of nervous affections. Morbid states of the biliary secretion are amongst the most important in pathology. Impure air, want of exercise, increased temperature, rich or full living, stimulating liquors, &c., change both the quantity and the quality of this fluid; rendering it either more copious, or of a deeper colour, and of a more acrid quality, than in the healthy state. Its more languid circulation through the ducts, or its undue retention in the gall-bladder, owing either to indolent habits, or to exhausted powers of digestion and assimilation, favours the absorption of its more aqueous parts, increases its consistence, disposes certain of its constituents to crystallise or to concrete into calculi, and gives rise to various chronic disorders of the liver and of its related viscera. Obstructions to its passage or discharge, and various other circumstances, favouring its absorption on the one hand; and torpor of the liver, or suspended action of this viscus preventing its secretion on the other, and causing the accumulation of its constituents in the circulation; are important pathological conditions, and constitute no mean part of several acute and chronic maladies, besides those in which the biliary fluid is more especially disordered. (See CONCRETIONS—*Biliary*; JAUNDICE, and LIVER.)

98. (b) The *secretions* which are elaborated by the intestinal mucous surface are often remarkably changed, both in quantity and kind. Diarrhoea, dysentery, and cholera, present extreme increase and alteration, not merely of these, but frequently also of those poured into the digestive canal from the collatitious viscera, originating in the pathological states adduced above (§ 95.); and illustrate the action of morbid secretions upon the surfaces with which they may come in contact. When these secretions are produced in large quantity and altered quality, whether from a modified and excited condition of the vital actions, or from both, or from these conjoined with an impure state of the blood, the effects following their passage over the villous surface are often very severe, and even disorganising. Thus

an altered state of the salivary fluid inflames and ulcerates the mouth, tongue, and gums; and the irruption of a large quantity of acrid bile irritates the duodenum, excites severe vomitings and purgings, sometimes with spasms of the voluntary muscles owing to the irritation of the visceral nerves acting upon the related spinal nerves, and, in more chronic cases when morbid secretion is prolonged, even excoriates the intestinal surface. A similar effect very probably is occasioned by the intestinal fluids themselves, as shown in *dysentery*. But the injurious operation of the fluids poured into the digestive canal does not arise only from their morbid increase. Diminished secretion, if it be attended by the accumulation and retention of the fluid in the secreting viscera, and of the mucus on the villous surface, may prove equally detrimental, but more insidiously and slowly. Morbid increase of these fluids is usually an acute, and diminution of them a chronic, disorder. The latter is generally accompanied with alterations in their properties, especially if they are long retained. When the retention and alteration take place in respect of the mucus contained in either the solitary or aggregated follicles, dangerous or even fatal ulcerations, or other organic changes, may be the results. Their accumulations on the intestinal surface favour the production of worms, indigestion, constipation, colic, &c. The manner in which one secretion may be greatly increased, whilst the rest are suppressed, is remarkably illustrated in pestilential cholera. In this malady it would seem as if the efficient cause suppressed the vital manifestations of all other organs, determined the remaining vital influence and circulation to the digestive canal, and occasioned an uncommon increase and alteration of its exhalations; the serous portion of the blood being in great part evacuated in this situation, leaving a portion of its albumen lining the intestinal surface in the form of a muco-albuminous and tenacious exudation.

99. (c) The *excrementitious* secretions are also altered by the pathological states already specified (§ 95.). The changes of these, as well as of the foregoing fluids, are important agents in continuing or aggravating disease, and furnish some of the chief indications of its nature, progress, and terminations.—As the office of the organs which secrete this class of fluids is to expel those elements which are effete, and would be injurious to the frame if retained in the blood, it must necessarily follow, that any interruption to this function, and especially a complete obstruction or suppression of it, must be highly injurious. The dropsical effusions in various cavities following interruption to the action of the kidneys, and the more acute effects of entire suppression of their functions, fully illustrate this. As a large quantity of ingested matters is carried into the blood, either directly from the stomach, or along with the chyle, and discharged from it by the emunctories, it is evident, not only that the kind of ingesta will affect very remarkably the properties of the excretions, but that obstruction or even interruption of any one of them will be followed by serious effects, unless some other organ perform an additional office, vicarious of that which is suppressed; and even in this case, disease will generally ultimately arise.

100. α. The *menstrual* evacuation, and even the *lochia*, may be considered as excrementitious secretions, interruption or morbid increase of them being followed by similar consequences to those arising out of suppressed perspiration. That the menstrual discharge has essentially a depuratory effect upon the blood, is shown by the alterations which it undergoes from morbid states of the circulation; thus, I have seen copious catamenia, the fluid being remarkably offensive, irritating, and otherwise sensibly altered from the natural state, form the crisis of *erisipelas*, and fevers; and a copious, offensive, and excoriating lochia evidently the means of preventing the accession of those adynamic and malignant diseases which often affect puerperal females, owing to the respiration of the impure air generated by several females confined in one lying-in apartment. The catamenia, moreover, is diminished, increased, vitiated, or changed into a serous or mucous secretion—into *fluor albus*—by the same agents and pathological conditions (§ 95.) as affect the other excretions.

101. β. Morbid states of the *perspiration*, independently of its increase or decrease, are not infrequent attendants on both acute and chronic maladies. They may even accompany apparently sound health, particularly when the bowels are habitually constipated; this evacuation being sometimes so offensive, or both copious and offensive, as to render the person thus affected a nuisance to those near him. In this case, the skin evidently performs an office vicarious of the diminution of the intestinal secretions. The perspiration is generally promoted by excited vital action of the cutaneous surface; in which case it is fluid and warm. But it may also be much augmented by a very opposite condition of vital power, as by syncope, the skin being cold and clammy; or by the extreme vascular depression, occasioned by excessive fear. In these cases, the lost tone of the integuments, and of the excreting pores, allows the escape of a portion of the fluids contained in the superficial vessels. This change also occurs in many instances of extreme vital depression, and shortly before death in many diseases. It is a pathognomonic symptom of pestilential cholera, in which it is most remarkable; the cold, wet, livid, and shrunken surface, being the result not only of the suppressed vital powers, but also of the circulation of venous blood.

102. γ. The *urinary*, of all the excretions, is the least frequently suppressed; the consequences of such a state being, if not soon removed, the most dangerous, or rapidly fatal. Whilst the excretion is very much influenced by the quantity and nature of the ingesta, and by the temperature and humidity of the air, it is also variously altered by disorders of digestion, sanguification, and circulation; but more particularly by the conditions of the blood itself, by changes in the nervous influence, and by injuries to the spinal cord. On the other hand, interruptions of the urinary discharge affect the quantity and quality of the circulating fluid, disorder the nervous system, ultimately increase the exhalations and the other secretions, and change the constitution of the soft solids. The other pathological relations of diseased urine are fully explained in the article **DIABETES AND URINE**.

transition of one tissue into another—is of a less simple kind than that noticed above (§ 103.)—*a.* M. ANDRAL has shown that the same principle of development which obtains in the foetus, extends also to the morbid transformations of the natural tissues; and that as the cellular is the matrix of the other textures, so it may, from disease, be changed into most of the other simple structures. There are, however, certain facts connected with such alterations deserving notice:—1st. Cellular tissue, in being changed into some other, no further affects the proper texture of the organ, which it either invests or of which it forms the parenchyma, than in causing its atrophy in some cases.—2d. Cellular tissue cannot be transformed into the nervous, unless in situations where the latter previously existed: thus, nerves that are divided, and of which a portion is removed, are first connected by cellular tissue, and subsequently by the extension of medullary substance from each divided extremity.—3d. Other tissues, whose continuity has been resolved, have the breach repaired, in the first instance, by means of the production of coagulable lymph, which passes into the state of cellular tissue; this latter being frequently afterwards transformed into a texture analogous to that which was divided; thus, divided muscles are reunited by a fibrous tissue; and so on, as respects bone, cartilage, &c.—4th. The nature of the transformation of cellular tissue is sometimes regulated by the functions of the part: thus, when subjected to friction, it becomes a serous membrane; when exposed to external agents, it becomes tegumentary, &c.—5th. Other tissues, besides the cellular, may be transformed, but the alterations are similar to the natural changes they experience in the processes of foetal growth; cartilage being converted into bone, the mucous tissue into the cutaneous; or a reverse course may be followed, in respect both of these textures and of the muscular tissue, which can be changed only to the fibrous. Hence the metamorphoses of cartilaginous, osseous, fibrous, muscular, cutaneous, and mucous structures are much more restricted than those of the cellular.—6th. All tissues, when remarkably atrophied, present evidence of degeneration towards their primitive or rudimentary state, viz. to cellular tissue.

111. *β.* The *causes* of the mutation of one tissue into another are not easily ascertained. Some have ascribed it to inflammation or irritation. By ascribing it to modified nutrition, we merely express an obvious fact, the cause of which is thereby not more nearly approached. It certainly is not occasioned by inflammation, although several of the transformations may be accidental or contingent consequences of that condition, especially in its slighter grades; for, however we may irritate, or determine blood to a part, we shall not transform it, unless under circumstances identical with those that are concerned in the production of those alterations. The series of analogous changes that take place in the foetus is not connected either with irritation, or with inflammation, or with opposite states of organic action. We can, therefore, impute the metamorphosis only to modifications in the conditions and manifestations of life influencing the nutrition of the organ or part; for we know that increase of function, or of vital manifestation, will often occasion a transformation of nutrition in a

certain direction—will change cellular tissue to a higher grade of structure, as in the development of the organs of the foetus; whilst the diminution or privation of function—that is, of its due vital endowment,—will transform the organ which performed it into a more rudimentary tissue: thus, a part becomes atrophied from being unexercised, an unemployed muscle is reduced to a pale fibrous structure, and an impervious artery or duct to cellular tissue. In briefly noticing the specific metamorphoses of tissue, I shall commence with the simplest, and generally the earliest change, in the ascending scale of transformation.

112. (*a*) The *cellular tissue* having always existed as the matrix of the compound structures and organs, it is obvious, when, owing to suspended or abolished function, the superadded organisation devoted to such function is lost, that the cellular tissue will then remain as the primitive structural base. This is shown by the evidence already adduced. The coagulable lymph exuded during inflammation of serous surfaces may become organised into cellular, and even into serous tissue, and be the matrix of certain other changes (§ 140.).

113. (*b*) The *serous tissue*, and the cellular, are often transformed one into the other. Cellular substance may have serous cysts developed in it, in almost any part of the body, either from friction or pressure; or from the lodgement of a foreign body, or the existence of a coagulum, &c. But, independently of these causes, it may have cysts of various dimensions formed in it, either where it invests the different organs, or enters into their internal structure; the parenchymatous organs sometimes being either partly or altogether transformed into a serous sac, or having these productions attached to them. When thus developed, they have been attributed to irritation by some, to a diminution of the natural action by others, and to perverted action by several pathologists. There can be no doubt of the last being the case, whether other states of action may accompany it or not.

114. *α.* *Serous cysts* vary from the size of a millet-seed to that of a child's head; they exist either singly or in clusters, have their external surface in contact with the organ in which they are produced, and are either intimately connected with the cellular tissue surrounding them, or entirely without any organised connection. Red vessels are seldom seen passing into them. The structures immediately surrounding them may retain their natural appearance; or may lose it for a time and regain it; or may be shrunk and condensed; or be altogether atrophied, and expanded over the cyst, as in the liver, brain, lungs; or be merely congested, or moreover be softened, indurated, or surrounded by pus, or by tubercular matter, or by blood. In this last case, the cysts themselves are sometimes broken down, or partially destroyed. The investing cellular tissue may also become fibrous, cartilaginous, osseous, or even calcareous; and additional layers thus may be superimposed on the original cyst. The internal surface of the cysts may be smooth, or may present changes altogether similar to those which serous membranes experience from disease; it may be uneven, rugose, granulated, covered by specks of concrete albumen, or

either as masses, or as membranes; and of themselves, or with the serous or the fibrous transformations, or with both, may form the cysts or envelopes of these secretions. — 2d. *In the structure of parenchymatous organs*, the cartilaginous productions are formed, like the fibrous tissue, at the expense of the cellular. They may be deposited in masses, or in the form of envelopes of various morbid secretions. Whilst cartilage is most frequently formed beneath serous membranes, these membranes themselves never experience this change. It is rarely produced in the cellular tissue under the mucous or villous coats; and very rarely in these coats themselves, and then only consequently upon repeated or prolonged irritation. The osseous tissue may also be transformed into cartilage. But in respect of the change of muscle, and of parenchymatous viscera — as the liver, spleen, kidneys, &c. — into cartilage, it is more probable that the developement of this substance in the cellular tissue merely causes the disappearance of the proper structure in the part thus altered. There is, however, little doubt of a portion of brain being sometimes changed into cartilage. — 3rd. *In cavities lined by serous or synovial membranes*, cartilages have been found, either entirely loose, or attached by a membranous prolongation or pedicle to some part of the parietes. They vary from the smallest size to that of a bean, and are of different forms. They are generally homogeneous and elastic, and sometimes they contain osseous points in their interior. They have been found in the peritoneal cavity, by LAENNEC and ANDRAL; within the serous membrane of the brain; within the tunica vaginalis testis; in nearly all the articulations, but most frequently in the knee and shoulder joints; and even loose in the interior of serous cysts, by ANDRAL. As to their formation, this pathologist thinks, "that they derive their origin from their fluid exhaled in serous and synovial cavities;" whilst BÉCLARD and LAENNEC suppose that they are originally formed on the external surface of the membranes lining these cavities, and that they gradually protrude before them the portion of membrane covering them, thereby giving rise to the pedicles by which they are sometimes attached to the sides of the cavities. Morbid cartilaginous formations vary from a fibro-cartilaginous or mixed state, to one purely cartilaginous, in which the internal structure is perfectly homogeneous; they also vary in firmness. They occur in the following situations in some one of these states: — 1st, In false articulations; 2d, At the extremities of bones of which a portion had been long previously amputated; 3d, In the situation of ligaments belonging to ankylosed joints; 4th, In cicatrices; 5th, In compound tumours of the uterus, ovaries, and thyroid; 6th, In the form of incrustations or patches in the parietes of arteries; 7th, In the cysts and envelopes of morbid formations; 8th, In certain parenchymatous organs; 9th, In the interior of articulations; and 10th, In serous cavities, both natural and morbid.

122. (f) *Ossiform formations* differ in form, and somewhat in constitution, from the natural osseous tissue; and are generally confined to the cellular, the fibrous, and cartilaginous tissues. — a. The cellular substance is not susceptible of this change in all parts of the body; for ossific

deposits have not been found in the sub-mucous, although frequently in the sub-serous, cellular tissue; the serous membrane apparently still covering the osseous formations, and giving them a smooth pale surface. This change has been found in the sub-serous tissue in every part of the frame; and it generally begins with slight thickening, and the infiltration of a turbid fluid; morbid nutrition, very evidently in this instance, and, indeed, in most other cases, as I have above contended, commencing in vitiated secretion. The connecting cellular tissue between the coats of arteries, especially that below its serous coat, is still more frequently ossified than the foregoing. Also the cellular substance surrounding fistulous openings, foreign substances, and adventitious secretions or productions, often become incrustated by plates, or grains, or complete layers of osseous matter. Thus tubercles, hydatids, &c. are sometimes contained in osseous envelopes.

123. β. *Ossification of fibrous and cartilaginous textures* is a part of the process of developement in foetal and early life; and the process goes on through life, although generally in an imperceptible manner, until old age advances, when it extends more rapidly, and seizes on additional parts of these textures; the fibrous tissue of the arterial system, and the cartilages of the ribs, larynx, trachea, &c., being then often converted into bone. But when parts not liable to this change in old age are affected by it, or when those disposed to it are prematurely transformed, the circumstance is referrible to disease. The experiments of MM. CRUVILHIER and RAYER show that a certain degree of inflammatory action or vascular injection of fibrous, fibro-cartilaginous, or cartilaginous tissues precedes the osseous deposit; and hence the reason that fractures or injuries are often followed by ossification of the adjacent parts of these textures; and that simple irritation of a slight but continued form has given origin to this alteration. But, in many instances, no cause or appearance of inflammatory irritation could be traced to the ossified part; as when the coats of arteries, the dura mater, the capsule of the spleen, &c. are thus affected.

124. γ. The *form, texture, and constitution* of ossiform formations vary much, both from one another and from the natural structure. As to *form*, they are — 1st, *Granular*, and either isolated or in groups, their number being extremely various, and sometimes remarkably great; their size extends from a minute point to that of a pea; they are rounded, with either a smooth or a rough surface. — 2d, *Lamelliform* or *membraniform* — developed in the adherent surface of serous membranes, or in the parietes of cysts, &c. — of various sizes, and sometimes of several inches in diameter, and consisting of thin irregular plates. — 3d, *Amorphous*, — generally found either alone, or in conjunction with other morbid productions in the parenchymatous organs; they consist more of a phosphato-calcareous deposition, than of an ossiform formation. Their *texture* is — 1st, *Homogeneous*, and without fibres or any division into compact and spongy parts; 2nd, *Obscurely fibrous* or *radiated*, and more nearly resembling the natural flat bones. The *constitution* of natural bones is generally uniform; but that of the ossiform productions varies remarkably in respect both of their earthy or saline

originate either in changes in the nutrition of the natural tissues, the adventitious secretion being consequent lesion; or in the production of new substances, alterations of nutrition being later lesions; or even the secretions, as well as the natural tissues in which they are elaborated, may undergo subsequent transformations. So extremely diversified are the causes which induce these diseases; the states of vital manifestation and of vascular action by which they are attended at their origin and in their progress; and so remarkably are they modified in their course by external agents and intrinsic states of action; and, moreover, so insensibly do they pass into one another, and so frequently and variously are they complicated; that any arrangement must necessarily be arbitrary, and a choice of difficulties. In reference, however, to the varying characters of the adventitious formations having been had in the articles upon specific morbid structures, and upon the varying alterations which the principal tissues and organs present, I shall here only take a general view of them, in the following order: — 1st, Secretions adventitious to the frame, and devoid of organisation: 2d, Adventitious secretions associated with morbid nutrition; or those that are apparently organised, but which depend upon the adjoining tissues for their vitality: and, 3d, Those which become organised, and possess an independent life.

130. *A. Secretions adventitious to the frame, and incapable of organisation or vitality.* — These substances present no trace of fibres, laminæ, canals, or areolæ; they are of various degrees of consistency; and certain of them change either from a fluid to a solid state, or from the latter to the former. They consist chiefly of albumen, gelatine, and the usual salts found in the serum of the blood. The substances that fall under this description are: — 1. Pus; 2. Tubercle; 3. Fatty matter; 4. Glue-like matter, or the colloid matter of LAENNEC; 5. Melanosis, or black matter; and, 6. Saline ingredients. These may exist either singly, or variously associated.

131. (*a*) *Pus.* — This term has been applied to a morbid secretion, whose physical properties vary considerably. That form of it which is usually secreted in a state of the constitution not remarkably depressed or vitiated, is a homogeneous cream-like fluid, of a yellowish white colour, faint smell, and slightly sweetish taste. But it often departs far from this state; and even that which is secreted from the same surface, may be very remarkably changed in a very short period, generally owing to modifications of vital power and vascular action. Sometimes it very closely resembles a thick cream; at others a mixture of curds and whey; and at others a turbid serum, or a grumous sanies, or the dregs of wine. Occasionally it seems disposed to become solid, and to assume the appearance of tubercle. At one time it is quite inodorous, at another very foetid. Its colour also changes from white to yellow, from green to red; or this order is reversed. In some instances, it is yellowish green, or yellowish brown, and other related shades. The following are its varieties, according to its physical properties: — 1. Creamy, homogeneous, or laudable pus; 2. Curd-like pus; 3. Serous pus, or sero-puriform matter; 4. Muciform pus, or glairy puriform matter, or puriform mucus; 5. Bloody pus; and,

6. Concrete or lardaceous pus. These alterations are chiefly attributable to the texture in which it is secreted, to the degree of local irritation or action, to the period it has been retained, to the general state of vital energy and vascular action, to the condition of the circulating fluid, and to the diathesis and constitution of the patient. But these varieties often run into one another, showing that any arrangement of the physical appearances of this secretion must necessarily be arbitrary. In the scrofulous diathesis, however, it often presents certain distinctive characters, and inclines nearer to the curd-like variety, or seems more disposed to become solid, from the absorption of its serous portion, when it has been some time shut up. But the most specific differences that exist in pus are not to be ascertained by chemical research, nor external appearances. Two portions of this fluid, identical in every respect, will produce very dissimilar effects: when introduced beneath the cuticle, one will occasion merely a slight irritation; the other a most dangerous constitutional malady, capable of disseminating itself through thousands.

132. Pus has been found in every tissue, structure, and organ of the body, and in all the vessels, and in the blood itself, both imperfectly mixed, and in the centre of clots. It may exist in the tissues and parenchymatous organs, either collected in the form of abscesses, or disseminated and infiltrated through their structure. When formed in muscular, nervous, and even in some other structures, it is in reality furnished by the connecting cellular tissue, which is the chief seat of the inflammatory action producing it. In a great majority of cases, its presence, either in distinct collections, or in a state of infiltration, is accompanied with signs of irritation or inflammatory action; but instances occur, in which it is attended by no such appearances. The opinion, that it could be formed only where there is ulceration, has been shown to be unfounded: for it may be secreted on the surfaces of membranes, without any breach of continuity; or collected in the parenchyma of the organs, without any appearance of inflammation; or infiltrated between the fibres and in the areolæ of the tissues, without any loss of substance. It is met with in the second and last of these forms in the consecutive states of *suppuration*, or when puriform or sanious matters have passed into the circulation, from distant parts, or from disease of the veins, &c. When the production of pus has been preceded by any degree of vascular irritation, the surrounding tissues present — 1st, various grades of injection; 2d, various shades of colouration; 3d, different degrees of softening; 4th, solutions of continuity, which may either have preceded or followed the purulent secretion; 5th, the disappearance of the proper structure of the part, and its degeneration into cellular tissue, in the areolæ of which the pus is infiltrated. (For the various distinctive characters of pus, the pathological states which generate it, the symptoms that precede and accompany its formation, and the means of protecting the frame against its contamination, see the articles ABSCESS, § 7. *et seq.*; INFLAMMATION, and SUPPURATION.)

133. (*b*) *Tubercle* especially illustrates several of the pathological inferences stated above relative to the constitutional conditions favouring

noticed above, the organic molecules are thereby prevented from being so perfectly assimilated, or so highly animalised, and indeed vitalised, as in health; and that, the vital attraction requisite to due nutrition being weakly or insufficiently exerted, they proceed to arrange themselves according to the grade of vitality they possess, into much inferior beings in the scale of creation?

147. VI. OF DESTRUCTION OF ORGANIZED PARTS. — This may take place in three ways: — 1st. By interstitial absorption, by means of which the part is first *atrophied*, and afterwards altogether removed; — 2d. By superficial absorption, or *ulceration*, which may be consequent on inflammation, or may proceed from the pressure of adjoining parts, and from loss of vital cohesion in circumscribed portions of membranes or superficial tissues: — 3d. By *mortification*, owing to intense grades of inflammation, either absolutely or relatively to the state of local or general vital energy, — to a destruction of the nervous influence of the part, — to interruption of the circulation from disease of the vessels, — to pressure impeding both nervous power and vascular action, — and to generally depressed vital power, associated frequently with a morbid condition of the blood, and sometimes with diseased blood-vessels, or with external pressure: hence the readiness of the occurrence of any of the forms of mortification in old age, during dynamic and exanthematous fevers, from erysipelas, from deficient or unwholesome food, and from syphilis or mercurial cachexy; — and 4th. By the softening and swelling arising from the greatly diminished or lost vital cohesion of cellular and adipose parts, and their infiltration with a serous fluid (comprising the *Noma*, or *watery cancer*, of authors) giving rise to a form of disorganisation different from the foregoing, that often passes rapidly into a state of jelly-like solution and gangrenous erosion, particularly in the lips, cheeks, and genitals of children. A similar destruction sometimes also takes place in the stomach; and the true softening of the brain, in its extreme states, seems to be of the same nature. This species of disorganisation is intermediate between ulceration and gangrene. (See ATROPHY, CELLULAR TISSUE, GANGRENE, SOFTENING, and ULCERATION.)

148. V. CONNECTION OF MORBID ACTIONS AND OF ORGANIC LESIONS WITH STATES OF THE BLOOD. — Depressed and perverted states of vital power have been shown to be often connected with a deficiency, or vitiated state of the circulating fluid, in chronic and cachectic diseases, and with excrementitious plethora, or the accumulation of the constituents of the various secretions in the blood in the early and advanced stages of fevers. (See BLOOD, and DEBILITY.) Primary excitement, in either its local or general forms, is often caused, or at least favoured, by *vascular plethora*; and reaction, or secondary excitement, with local determinations or inflammatory action, is frequently produced by this condition, existing either absolutely or relatively, or associated with the accumulation in the blood of the constituents of the secretions and excretions, owing to the interruption of these functions, as in the stage of reaction in fevers (§ 85.).

149. The connection of the *lesions of secretion* with the states of the *circulation* is one of the most important topics in pathology, and has

therefore been noticed in this (§ 95. *et seq.*) and other articles. The superabundance and transformations of one or two of the natural secretions are sometimes owing to the alteration, interruption, or suppression of others, — to the derangement of the balance of healthy action, and to the consequent plethora or vitiation of the circulating mass. Thus, morbid states of the cutaneous or of the intestinal secretions are often caused by inactive function of the kidneys or liver; and alterations of the urine, or of the bile, are frequently produced by suppression of the perspiration, or of the secretions from mucous surfaces. Morbid increase of the exhalations, particularly those poured into serous cavities, or into the areolæ of cellular parts, is, in many instances, connected with *general plethora*, as well as with *local congestions*, and deficient excretion; whilst the transition of congestions into inflammations, and the transformation of these exhalations into a fibrinous, or fibro-albuminous substance, by sthenic inflammatory action, are promoted by the abundance of this constituent in the blood, and the general exuberance of this fluid. When the excrementitious secretions are imperfectly elaborated owing to depressed vital power, the functions of chylification, sanguification, nutrition, and depuration are also impeded; the usual results being insufficient excretion, an impure state of the blood, and ultimately slow irritative fever, marasmus, anæmia, and other chronic diseases. In such cases the morbid phenomena proceed in a circle, or rather act and react upon each other, either until vascular excitement is produced by the state of the circulating fluid, and the secreting and excreting functions are thereby restored, as shown in the article CRISIS (§ 15.), or until some organic changes supervene. If we attempt to trace the procession of morbid actions, we shall often find that depressed vital power affects the secretions subservient to sanguification; these modify the quality, and ultimately the quantity of the blood; the altered condition of this fluid disorders the vascular actions and depurating functions, whilst it further deranges the nutritious secretions; and thus the evil continues to increase until the living solids become changed, and incapable of performing their prescribed actions.

150. In connection with the various *lesions of nutrition* which have been brought into view, the blood can seldom long retain its healthy state. But the change is evidently, in the first instance, that of quality rather than of quantity, although it is very difficult to show in what respect the quality is modified. Excessive excretion and discharge will often, however, sensibly diminish the quantity of this fluid before any other change either in it or in the functions of nutrition becomes apparent. Local alterations of secretion and nutrition conjoined, whether originating in the organic nervous influence of the part, or in the quality of the blood circulating through it, ultimately change both the one and the other, and generally in a way that cannot be mistaken. In many instances the alteration of the blood is evidently owing to the absorption of the molecules which had been deposited, secreted, or combined in the morbid structure, and removed in the usual course of that transition of the solids into fluids, which obtains in the living economy, equally with the transition of fluids into solids. Animal

for an indefinite time — varying from a few hours to several days, weeks, or, in local maladies, even to some months — presenting slight modifications and vacillations, tending either to a favourable or unfavourable termination. — (b) Of the period of crisis, in which new phenomena appear, indicating either a salutary or fatal issue. The whole duration of this stage is, in febrile diseases, generally shorter than that of the first; but there are numerous exceptions to this rule. — C. The third stage, or that of **DECLINE**, consists — (a) of the period of *decrement*, or *exhaustion* in which the symptoms subside more or less rapidly, and the vital organs begin to resume their functions, in favourable cases; or the energies of life to sink, in those of an opposite tendency. — (b) Of the period of *convalescence*, in which the remaining traces and consequences of the malady disappear, and the vital and animal functions regain their healthy condition and balance.

153. There may be some doubts of the propriety of adopting certain of the above subdivisions, as they are chiefly applicable to febrile diseases; but they likewise obtain in some other maladies. In those in which they are less remarkable — namely, in organic diseases — any division into stages can seldom be adopted with advantage, or be made otherwise than in an arbitrary manner. In these maladies, and, indeed, in some others, the second or formative period of the first stage may not be manifest; nor the second, or critical period of the second stage; and many may question the propriety of making *convalescence* a period of the disease. But I believe, that, during the restoration of the various functions, there still remain certain pathological states or degrees of disorder, requiring the attention of the practitioner; and, in many instances, a marked tendency to relapse upon exposure to the exciting causes of the malady. For pathological reasons, therefore, as well as on account of the future health of the patient, *convalescence* should be always treated as a period of disease.

154. ii. *Grades of Action*. — The terms *active* and *passive* have been much employed in pathology, and often without regard to precision. They should have reference only to the kind of vital action characterising disease, and not to its duration; with which, however, they have been too frequently confounded. Thus the term *active* has been often employed synonymously with *acute*, and *passive* with *chronic*. But, although an *active* disease is generally *acute*, it is not so always or necessarily, and may even be of a *chronic* duration; whilst the most *passive* maladies, as respects the grade of vital action, may be most *acute* with reference to their continuance. It should never be overlooked, in our appreciation of pathological conditions, that medical terms are only conventional or arbitrary signs, employed, often too indefinitely, to convey our ideas of certain ever-varying conditions of vital manifestation and organic change; and that, in using the words *active* and *passive*, we should restrict them entirely to the expression of grades of vital action, and view them as possessing an arbitrary as well as a relative import, inasmuch as there is every intermediate degree between the most *active* and the most *passive* states of disease.

155. iii. *Of the Type or Form of Disease*. —

The *type* is the order of succession observed to obtain among certain morbid phenomena; and admits of modification from various causes, without the intrinsic nature of the phenomena being essentially affected. It has commonly been divided into the *periodic* and the *continued*; the former being subdivided into several specific forms. — A. *Of the periodic type, and the periodicity of morbid actions*. — The intermissions or remissions of morbid phenomena, and their return or exacerbations after regular or nearly regular periods, constitute their periodicity; and are characteristic features of a number of diseases. These features, are, however, more or less modified and marked in certain maladies than in others, in respect both to the paroxysms or accessions of morbid action, and to the intervals which separate them; and hence periodic maladies admit of various modes of arrangement, of which, however, that into the *febrile* and *non-febrile* (*pyrexial* and *apyrexial*) seems to be the preferable. The former are characterised by the regular stages of febrile action which the paroxysm presents in most instances, and the definite duration of the intervals or remissions: the latter are remarkable for the suddenness of attack, and their evident dependence upon, and affection of, the nervous system; as well as for the less regularity of their intervals. Of the various modifications, which these two classes of disease present, sufficient notice has been taken in the articles on **FEVERS**, and on the nervous disorders which possess this feature, especially **ASTHMA**, **EPILEPSY**, **HYSTERIA**, and **NEURALGIC AFFECTIONS**.

156. The cause of the periodicity of many diseases has never been satisfactorily assigned. Some have imputed it to the daily alternation of the erect and supine postures; others to the action of light, or, in other words, to solar influence. There is a certain tendency to periodicity in almost all diseases, in which the nervous functions are more or less affected, and even in *convalescence*; the remissions being often scarcely perceptible, and the exacerbations generally assuming the tertian type. The periodicity of morbid actions cannot be explained otherwise than by referring it to a law of the animal economy; and, as those maladies, in which the nervous systems are primarily and chiefly affected, are most remarkably periodic, we may infer that it is especially dependent on these systems. This law obtains to a certain extent in health, as respects the performance of many of the vital functions; its existence in disease, in a more evident or modified form, should not therefore be a matter of surprise, particularly when the functions of those systems on which it is more immediately dependent are principally affected. It is most distinct, and the intervals most complete, in maladies consisting especially of disturbance of the organic and cerebro-spinal functions, and in those in which the excretions are not much impeded, and the blood consequently not materially altered from the healthy state, or where the other causes to which the continued type is attributed (§ 157.) do not exist.

157. B. *The continued type* consists of an uninterrupted succession of the morbid phenomena, from the irruption of the disease to its termination. Some maladies present a nearly regular intensity during their course, and have therefore been called

by the older writers "*morbiccontinentes*." Others evince slight morning remissions, with exacerbations in the afternoon or towards evening: others, in addition to these, experience some degree of exasperation on certain, most frequently on alternate, days; and others, as some kinds of fever, assume at first a remittent form, but soon become continued, and at last again slightly remittent during convalescence. Even the more strictly continued febrile diseases evince a remitting or periodic type, in some degree, during decline or early convalescence. It would seem that a marked tendency to periodicity exists in all diseases, and that the continued type is imposed — (a) by a high degree of inflammatory action; (b) by impeded or interrupted secretion and excretion, and consequent alteration of the quality and quantity of the circulating fluid. Thence it may be inferred, that the type will be the more evidently continued, the greater the pathological states to which I have chiefly imputed it; and that, as in respect of other medical terms, *continued* or *periodic* are usually employed in an arbitrary manner, — the one type passing into the other, the regularly periodic and the continued forming the extremes of the scale, between which there is every grade, ascending from the former, or regularly intermittent, through the less perfect and the remittent, until the continued is reached.

158. iv. *Of the Duration of Morbid Actions.* — The period intervening between the actual irruption and the termination of disease is of very various length. Hæmorrhages sometimes continue only a few minutes, cholera a few hours, whilst asthma, rheumatism, and gout, may remain the greater part of life. Some maladies, originating in infection, have a specific duration, as small-pox, measles, typhus, &c. If we calculate from the time when the exciting cause made its impression, many diseases, whose length often appears definite, will present a much less uniform character. Thus, in plague and other pestilential maladies, the effluvium from the sick has sensibly affected the healthy, and terminated existence in a few hours from its impression, whilst other persons have not been seized by the fully formed malady until many days after exposure to its cause. Marsh miasmata have, in some instances, not produced ague until several weeks after their impression was made on the frame; and the rabid virus has sometimes not occasioned its dreadful effects until many months after its inoculation. If we comprise the time that elapses from the first manifestation of functional disorder, to its termination from fatal organic lesion, the duration of numerous diseases will not infrequently form no mean portion of the usually allotted period of existence. Some maladies of a slight and febrile kind, depending upon disturbance of the stomach or bowels, occasionally subside in a few hours, or in a day or two, and from this circumstance have been called *ephemeral*.

159. A. The terms *acute* and *chronic* are very arbitrarily employed to designate the duration of morbid actions; and, owing to the circumstances of their being often used as general but loose characteristics of disease, they have been mistaken by the inexperienced as indicating the existence of two forms, between which there is none intermediate. To this misconception medical writings have contributed, chiefly by de-

scribing merely these two conditions as simple and unvarying forms, instead of considering them as arbitrary signs employed to indicate the more extreme states, in respect of duration, between which there may exist every intermediate degree. Many employ these terms, to express not only the duration of morbid action, but also its grade or intensity. Of this little need be complained, if the meaning attached to the words be previously assigned. Numerous writers, impressed with the vague manner in which these appellations have been used, have endeavoured to give them a greater degree of precision by adjoining qualifying epithets to them. — (a) Diseases have been generally viewed as *acute*, when they are not prolonged beyond forty days; some writers subdividing those thus characterised, into the "*most acute*," when they terminate in three or four days, — into the "*very acute*," when they do not continue longer than seven days, — into the "*simply acute*," when they endure for fourteen days, — and into the "*sub-acute*," when they reach forty days. — (b) Maladies which are prolonged beyond the last term have been usually designated *chronic*; but they hardly admit of a similar subdivision to the above, their duration being indefinitely prolonged. The subdivision of them into *functional* and *organic*, if the distinction could be made during life, would be of practical importance; but, although it might be made in diseases of some organs, it cannot so readily in respect of others: besides, most chronic ailments are first functional, and so gradually and imperceptibly run into organic change, that no line of demarcation can be drawn between the two states.

160. VII. OF THE TERMINATIONS OF DISEASE. — Morbid actions end ultimately in two ways: 1st, In health; 2d, Death. But before terminating in either, they may assume other forms, or altogether distinct characters; giving rise to what may be called the succession, the transition or conversion, and the metastasis of disease. — 1. *The return to health* consists in the restoration of all the functions. It takes place in ways peculiar to the nature of the malady, and consequently in very diversified modes. — (a) In *local diseases*, and in those simple pathological states consisting of debility, excitement, exhaustion, &c. the terminations in health are the most direct. Nervous affections and hæmorrhages commonly end by the mere cessation of the phenomena of which they consist; and a similar occurrence obtains in respect of simple congestions and various functional complaints, as jaundice, disorders of the stomach and bowels, &c. In the restoration, however, of inflammations to the healthy state, the changes are more numerous, the various phenomena of which this lesion is composed either disappearing in succession and gradually, that is, in *resolution*; or giving rise to other alterations of a more or less serious or disorganising kind; and these to new secretions and states of nutrition, as purulent collections, ulceration, sphacelation, and ultimately to the productions of coagulable lymph, granulations, and cicatrisation. — (b) In *febrile* and *constitutional* maladies, the return to health is generally the result of a series of changes in the economy, however rapidly it may take place; and is usually characterised, first, by the subsidence or

exhaustion of the morbid state constituting the chief pathological condition, and, *second*, by the restoration of the secreting and excreting functions, the interruption of which constituted one of the chief features of disease. (See *CRISIS*.)—

(*c*) In *organic lesions*, the restoration of the health is less frequently effected, either by nature or by art, than in the preceding classes of disease, and is usually the result of modifications of the secretions and nutrition of the part different from those in which the organic alterations originated. Consequently the return to the natural structure is generally slowly, and often only partially, accomplished,—is always aided by a due manifestation of the vital energies and performance of the secreting and excreting functions,—and is frequently favoured by irritation of, and derivation to, some remote tissue or viscus, occurring spontaneously, or excited by art.

161. In all diseases, the restoration to health is as much owing to the vital energy, as to subsidence of the particular morbid actions which constitute them. Thus, acute or sub-acute inflammations occasion various changes of structure; yet the mere disappearance of the inflammation does not constitute the return to health. The organic lesions still continue; but these are ultimately removed in the course of that constant process of attraction from, and dissolution into, the blood, of the special molecules of the tissues. Secretion and nutrition have been shown to be not the mere deposition of organic particles, but a constant circulation of these particles from the blood into various fluid and solid forms, and back again into the blood, after having retained these forms for a longer or shorter period; and, as the organic molecules are identified with the various structures, in virtue of the vital influence and attraction which actuate these structures, it follows that the more this influence is exerted, the more will nutrition be perfected, and any aberration from the healthy form avoided and restored. Consequently, in the course of this process, the natural type of formation will be preserved, and any morbid production be removed.

—(*a*) Various phenomena (*critical changes*) of a very marked character indicate the termination of acute diseases in health; and have received, from their importance, the attention of physicians. (See *CRISIS*.)—(*b*) As the functions become re-established, and the pathognomonic symptoms subside, and at last disappear, so the decline of disease passes into *convalescence*, in which, at first, more or less of the phenomena constituting the disorder, and of debility, not merely of the organ chiefly affected, but also of the rest of the frame, still remain; the functional or the organic lesion gradually disappearing as the manifestations of life throughout the system become more and more developed, or attain their healthy state and balance. (See *DEBILITY*, § 43.)

162. B. The termination in death takes place in various ways, both in *acute* and *chronic* diseases. It may occur in the *former* more or less suddenly

—(*a*) from rapid sinking of the vital powers, as in adynamic fevers; (*b*) or from fatal hæmorrhage before exhaustion has reached its utmost, as in some diseases of the lungs and digestive canal; (*c*) or from pressure on, or interrupted circulation through, the brain, accompanied with convulsions, or coma, or with both, as in various diseases of this organ; (*d*) or from profound or prolonged

syncope and sudden cessation of the heart's action, as upon quickly assuming or retaining the erect posture in states of exhaustion; (*e*) or lastly, from *asphyxy*, as pointed out in that article. Death may also occur much more slowly in acute maladies, owing to the gradual sinking and abolition of the vital manifestations; giving rise to the collapsed countenance, the frequent, weak, and unequal pulse and respiration; the loss of animal heat, and cold clammy perspirations, the resolution of the sphincters, and insensibility, the cadaverous smell, &c. observed some hours previously to, and ushering in, dissolution. In some *chronic* maladies, death often occurs suddenly, as in organic diseases of the heart, large blood-vessels and lungs, owing to effusion into the pericardium, interruption of the heart's contractions, to rupture of its cavities or valves, to bursting of aneurisms or profuse hæmorrhages, to suffocation from effusion into the bronchi, or into the pleural cavities, &c. More frequently, however, death takes place slowly in this class of maladies; and is chiefly owing to the exhaustion of the vital energies, or to the disorganisation of some important part, and the interruption of a vital function, disordering and ultimately obstructing others; as when fluid is slowly effused in any of the large cavities.

163. VIII. OF THE RELATIONS, SUCCESSIONS, AND COMPLICATIONS OF DISEASE.—A. The relations of disease are not easily explained in many instances; in others, however, they are more obvious. It cannot be shown wherefore a state of erethism, or inflammatory irritation of the digestive mucous surface, should frequently co-exist with acute or chronic eruptions on the skin otherwise than by supposing that the state of the circulating fluid is such as to excite or irritate the vascular reticulations of both the skin and villous membrane; and, although this fluid may be in excessive quantity in the majority of such cases, yet quantity merely will not account for the phenomena, without calling into aid an alteration of quality; which, while it excites the digestive mucous surface, also inflames the cutaneous vessels, during the depurating process they exert upon the blood. But the state of this fluid will not explain all the relations of complicated morbid actions. The reciprocative influence of the organic nervous and cerebro-spinal systems, and of the former and the vascular systems, must be considered as the earliest and chief sources of morbid associations. When the dependence of vascular action, and of the secreting and excreting functions on the organic nerves,—of the conditions of the circulating fluid on the states of these functions,—and of the cerebro-spinal manifestations on both the organic nervous and vascular systems—on the strictly organic actions,—is duly considered, the relation and succession of several morbid conditions will appear as necessary results of this union. When we perceive the processes of digestion, secretion, and defecation imperfectly performed—processes essentially dependent upon the organic nervous influence—should we be surprised to observe further disorders supervene; and are we not rather to expect morbid phenomena to present themselves, referrible to the vascular system, to the circulating fluid, to the nutritive functions, and to the purely animal manifestations? When important eliminating processes are either impeded or increased

infrequently occasions consecutive changes in the organs which elaborate or retain them. Obstructions to the due evacuations of the urine, from obstacles existing either in the urethra or about the neck of the bladder, or in the ureters, superinduce alterations of the kidneys, or of the bladder itself; and disease of the biliary ducts commonly associates with it lesions of both the gall-bladder and liver, and of the digestive canal; furnishing examples of *superinduced complications* (§ 165, 3d.).

169. (d) Changes in the quantity and quality of the circulating fluid, especially when carried far from the healthy state, although usually the consequences of disorder of one or more of the secreting and assimilating viscera, yet become the causes of co-existent disease of several organs and structures, modifying their interstitial secretions, their nutrition, and their vital cohesion and manifestations; the whole organisation generally presenting more or less of change. These complicated effects may assume varied forms, and implicate particular organs in a more remarkable manner than the others, according as either plethora or anæmia may be associated with the accumulation of excrementitious matters in the blood, or as the quantity and nature of these matters may vary—thereby causing diversified *humoral complications* (§ 165, 4th.).

170. (e)—*α*. When we advert to the circumstance of disease, essentially the same having different symptoms, and producing varied effects, merely in consequence of a slight difference in its seat, one reason for the frequency of what should be called rather the extension or succession of disease, than its complication, will be apparent. Thus, when inflammation of the fauces extends down the trachea and bronchi, there may be either a succession of disease, if the inflammation disappears from the former seat as it extends to the latter; or a complication, if it exist at the same time in all; and yet the nature of the morbid action is essentially the same, as long as the vital energies remain unaltered. When inflammation extends along the digestive mucous surface, or to distinct parts of it only, a similar succession or complication, but without difference of the nature of the disease, also obtains. These are instances of the *succession or complication of continuity*.—*β*. But disease may extend from one tissue to another, instead of being thus limited to the same, as in the above instances;—it may originate in a membranous surface, and involve the substance or parenchyma of an organ, and ultimately even its opposite and differently organised surface, and either disappear from the former upon affecting the latter, or implicate them all simultaneously, thereby giving rise to a succession or complication of morbid actions, without altering their characters, although materially changing their symptoms. Thus, bronchitis may pass into pneumonia, and this latter into pleuritis, or they may all co-exist; and inflammation of a part of the digestive mucous surface may be extended to the cellular tissue connecting the coats of the alimentary tube, and thence to the peritoneum; and so on in respect of other organs, which, equally with these, not infrequently furnish examples of the *succession or complication of contiguity* (§ 165, 5th.).

171. (f) Irritation and other disorders of an organ or part not infrequently associate with them

a morbid condition of remote as well as adjoining parts. Worms in the intestinal canal often induce either febrile or convulsive affections. Congestion, inflammatory irritation, erethism, or merely functional excitement of the female organs, may occasion epilepsy, irregular or anomalous forms of convulsions, hysteria, altered sensibility of the nerves—referred by some writers to irritation of the spinal chord—vitiated appetite, and disordered manifestations of mind. Injury of a tendon or nerve may produce tetanus; and the accumulation of fecal matters in the large bowels may excite, and be complicated with, various disorders of the stomach, inflammation and ulceration of the fauces and pharynx, febrile disturbance, hæmorrhoids, numerous nervous ailments, and disorders of the uterus. These may be termed the *sympathetic associations or complications of disease*.

171. (g) That injudicious treatment often complicates disease, may not be so readily admitted as the circumstances now adverted to. But I can state, as the result of observation, that lowering measures carried too far will occasionally favour the extension of disordered action and structural change, either by continuity or contiguity (§ 170.), or by promoting the function of absorption, and the passage of morbid matters into the blood (§ 169.); and that stimulating remedies used too freely will, either by their operation on secreting organs and surfaces, or by irritating the parts to which they are applied, sometimes superinduce inflammatory action in addition to the disease which they were intended to remove. Thus, arsenic exhibited too freely, in order to cure agues, has produced inflammation of the internal surface of the heart and arteries; and bark of quinine, given freely before morbid secretions and fecal matters have been carried off by purgatives, has superinduced hepatitis or dysentery, or both, upon the intermittent disease for which it was prescribed. Stimulants and tonics taken in some forms of dyspepsia, as complicated functional or structural disease of the stomach, liver, and bowels; and astringents imprudently employed, have excited inflammation in the organ whence the discharge, for which they were exhibited, proceeded, as well as disease in some related organ.

172. IX. OF THE METASTASIS OF DISEASE.—*Metastasis* (μετάστασις, a change, migration, from μεταστήμι, I change, or transfer) of disease has been often improperly confounded with the terms *Metaptosis*, *Epigenesis*, *Diadoxis*, and *Metaschematismus*, which have had different meanings attached to them. *Metaptosis* has usually been used to mean a change in the nature or state of a disease, without a change in its seat;—*Epigenesis* the superinduction of another, upon an antecedent, disease; the anterior affection not being ameliorated by the occurrence;—*Diadoxis*, the succession of a less, to a more, important malady;—*Metaschematismus*, the transformation of disease simply;—and *Metastasis*, the displacement or disappearance of disease from one part of the frame, and its seizure of another of more vital importance. It will be perceived, that the phenomena, which these terms have been employed to express, have been already noticed, excepting those which fall under the last. When rheumatism or gout disappears from a joint and attacks the head, heart, or stomach; or when erysipelas, or any febrile or chronic eruption, forsakes the surface and is fol-

&c., the suppression of the eruption not infrequently produces one or more of the above effects, and constitutes the chief diseased appearances in fatal cases.

175. C. There is another form of metastasis, that consists chiefly of morbid secretion; and although vascular action is concerned in producing the matter found in the secondary seat of disease, still the transfer from the original seat evidently takes place through the channel of the circulation. We not infrequently observe purulent or ichorous matter, which has been formed in one part, removed from thence, and infiltrated, or secreted and accumulated, in another part; occasioning consecutive abscesses (see Abscess), or some other structural change, in a parenchymatous organ, or puriform effusion into natural cavities. In these cases, the passage into, and presence of morbid matter in, the blood, excite increased vascular action in some part by means of which it is either evacuated from the system, if the morbidly excited part be an emunctory; or infiltrated and collected, if it be a parenchymatous organ; or effused and retained, if it be a serous or synovial cavity. Thus, collections of puriform matters have been found in the liver, in the joints, in the lungs, in the brains, &c. after small-pox, erysipelas, fevers, inflammations of veins, or of remote or external parts, and after fractures; and often without any antecedent disease of the viscera thus consecutively disorganised, or disorder referrible to them, proportionate to the extent of disorganisation observed on dissection of fatal cases.

176. D. From the foregoing I conclude, 1st. That metastases may be divided into—(a) those manifesting fully expressed disordered action, in which the sensibility is more or less excited; and (b) those consisting of latent disorganisation, and produced chiefly through the medium of the circulating fluid: or into—(a) those which affect the substance of an organ; and (b) those which take place to an excreting surface or viscus—as the skin, the intestinal mucous surface, the kidneys, and the salivary glands—and which frequently terminate favourably by evacuation from the circulation of noxious matters that were the chief cause of the metastasis.—2d. That they are brought about—(a) by means of the organic nervous system, as in gout and rheumatism;—(b) by the influence of this system of nerves upon the blood-vessels and capillaries, determining to various surfaces or structures a preponderating degree of morbid action and its results, according to the operation of numerous intrinsic and extrinsic causes, as in exanthematous metastases;—(c) by the absorption of hurtful matters into the circulating current, where they excite, internally as respects the capillaries, the increased or morbid action of some secreting surface or emunctory, or occasion the disorganisation of some predisposed parenchymatous organ.

177. X. THE CIRCUMSTANCES MODIFYING THE FORM, COMPLICATIONS, DURATION, AND TERMINATIONS OF DISEASE, are as numerous as the causes,—predisposing, exciting, and determining,—in which it originates. The constitution and diathesis of the patient; a cachectic or vitiated habit of body; the continued operation, during the course of the disease, of the causes which induced it; the depressing passions; impure or stagnant air; all sudden mental and physical per-

turbations; extremes of temperature; injudicious treatment and regimen; the use of medicines which either suddenly or intensely excite, or depress, the vital or nervous energies, and weaken the restorative powers; neglect of evacuations, and of the state of the secretions and excretions; the *nimia diligentia* of the practitioner, or improper interference with the salutary processes of nature, and with critical evacuations and changes; the too early recurrence to a full or stimulating diet, or exposure during convalescence to any of the causes specified above; will not only modify the states and duration of disease, but also occasion the succession of one disease into another, render morbid action more or less complicated, transfer it from one structure or organ to another, and occasion relapses of greater or less severity. (See PHYSIC—Practical Principles of; and SYMPTOMATOLOGY.)

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DROPSY. — SYN. ὕδρωψ, Th. (ὕδωρ, water, and ὥψ, aspect, appearance.) *Hydrops*, Lat. *Hydropisie*, Fr. *Die Wassersucht*, *Die Hydropsie*, Germ. *Idropisia*, Ital.

CLASSIF. — 3. Class, Cachectic Diseases; 2. Order, Intumescences (*Cullen*). 6. Class, Diseases of the Excremental Function; 2. Order, Affecting Internal Surfaces (*Good*). IV. CLASS; I., II., and III. ORDERS (*Author*).

1. NOSOL. DEFIN. The accumulation of watery fluid in the natural cavities, or in the cellular areolæ, or in both, causing distension, impeded functions of the affected and adjoining parts, frequently with fluctuation, softness, &c.

PATHOL. DEFIN. A collection of fluid arising either from increased exhalation or from diminished absorption, each of which conditions depend upon antecedent states of disease.

2. After having taken a general view of the nature and treatment of dropsical effusion — of Dropsy in its generic acceptation, — I shall proceed to consider its specific forms. By thus viewing, in a connected manner, the various species of dropsy, which have been improperly separated the one from the other, much unnecessary repetition will be avoided, and several advantages obtained.

3. I. PATHOLOGY OF DROPSY. — i. *Brief Historical View of Opinions*. — Different views of dropsical diseases may be found in several parts of the writings ascribed to HIPPOCRATES. There can be no doubt, however, of the connection between them and a state of active vascular disorder, as well as of obstructions of the liver and spleen, having been known to him. ERASISTRATUS is said to have referred these maladies chiefly to engorgements of the liver; and ASCLEPIADES to have viewed them as being either acute or chronic. AETIUS gave merely a lively description of the history of dropsies: but GALEN, in the unconnected observations on these maladies scattered through his writings, stated some just views of their nature. He pointed out the seat of the ascitic effusion; contended, in opposition to

ERASISTRATUS, that dropsies often depend upon other causes, and upon disease of other viscera, beside hepatic obstruction; and that they frequently proceed from a morbid state of the blood. CÆLIUS AURELIANUS assigned, as their causes, lesions not only of the liver, but of the spleen, of the womb, and of the large and small intestines. AETIUS made some reference to a cachectic habit of body in relation to them; and ALEXANDER of Tralles noticed, but in a superficial manner, their connection with diseases of the lungs, and with antecedent fevers and inflammations.

4. Amongst the Arabian writers, little respecting dropsy beyond what is contained in the works of their predecessors is to be found. AVICENNA, however, attributed it to the liver and to the kidneys; and stated that the latter, owing to the coldness or warmth of their temperature, or to obstruction or induration of their structure, fail to attract or separate the watery fluids. MESUE gave a similar view to the foregoing, and both agreed in stating that the liver does not concoct pure, but a watery and phlegmatic, blood. When we reflect that the lights of modern science have shown that the liver is both indirectly and directly concerned in sanguification, that the crisis and vital constitution of the blood is really affected in many states of dropsy, and that the kidneys are often very demonstratively diseased, and in a way that may be expressed in general terms nearly similar to those used by AVICENNA, we must conclude, that some of the pathological opinions of the ancients are not so despicable as many of the moderns suppose; and that, even in recent, as well as in bygone, times, there have been more absurd theories than sound views of morbid actions, and a greater disposition to generalise from a few imperfectly ascertained states of disease, than to take into account numerous concurrent circumstances and morbid associations.

5. Since the revival of learning, but little was added to the knowledge of dropsies, until the writings of WILLIS appeared. This very eminent physician first called in the state of the vessels to the explanation of these diseases; and argued that, whilst the vascular extremities are either too relaxed or too constricted, causing thereby an increased effusion and diminished absorption respectively, the blood itself is often altered, and its circulation impeded by scirrhus tumours, tubercles, and obstructions in any of the abdominal viscera. ERTMULLER and LISTER adopted the views of WILLIS. The experiments of tying the veins, first performed by LOWER, confirmed the opinion promulgated, but not carried its due length by WILLIS, that interruption of the venous circulation is a chief cause of dropsical effusions. F. HOFFMANN repeated the experiments of LOWER, and, as well as BOERHAAVE and VAN SWIETEN, admitted the importance of venous obstruction in the pathology of dropsies. MORGAONI says, "Quacunque causa diutius potest sanguinis aut lymphæ cursum morari, aut humoris quo cavæ corporis madent, aut secretionem augere, aut exitum deinde imminuere morbo huic potest originem præbere." LUDWIG first directed attention to an atonic state of the vessels as a principal source of those maladies, and his contemporary MILMAN assigned as their chief causes a laxity of the fibres, exhausted power arising from copious evacuations, and acute diseases passed into the chronic state,

times owing to concomitant jaundice, or disease of the liver occasioning the accumulation of the colouring constituents of bile in the fluids; and the green, brown, or black colour probably arises from the presence of a portion of the colouring matter of the blood. The offensive odour, as well, perhaps, as some of the above alterations, may be the consequence of the admission of air into the cavity after tapping, and of the super-vention of inflammatory action upon this operation, or of the long retention in a high temperature of a fluid containing a large proportion of animal matter, or of both circumstances conjoined. The liquid effused into the ovaria is generally possessed of very different characters from those presented by the fluid found in the pleurae or peritoneum; and that of chronic hydrocephalus and spina bifida is commonly different from all others, — the liquid found in the ovarium, and in the brain, presenting, respectively, the opposite extremes of fluidity, or rather of animal matter. As the properties of the fluids are different not only in the several seats of the effusion, but also according to the states of vital action accompanying it, but little importance can be attached to the results of chemical analysis, unless they be derived from an extensive and diversified series of cases. These obtained by Dr. MARCET, are not materially different from those furnished by BOSTOCK, BARNUEL, and BERZELIUS, who found that all the specimens of fluid contain nearly the same saline ingredients as the serum of the blood; and that the chief difference consists in the quantity of animal matter, chiefly albumen and incoagulable mucus (the osmazome of BERZELIUS and BARNUEL) they furnish. The following table is given by Dr. MARCET: —

In 1000 grains of fluid.	Specific gravity.	Total solid contents.	Animal matter.	Saline matter.
Fluid of Spina bifida -	1007.0	11.4	2.2	9.2
Hydrocephalus -	1006.7	9.2	1.12	8.08
Ascites -	1015.0	33.5	25.1	8.4
Ovarian dropsy -	1020.2	—	—	8.0
Hydrothorax -	1012.1	26.8	18.8	7.8
Hydrops pericardii -	1014.3	33.0	25.5	7.5
Hydrocele -	1024.3	80.0	71.5	8.5
Blister -	1024.1	—	—	8.1
Serum of Blood -	1029.5	100.0	90.8	9.2

12. B. *The lesions of the viscera* which are connected with the production of dropsies, comprise almost every variety of which these viscera are susceptible. The heart, its valves and membranes; the blood-vessels, particularly, the veins and lymphatics; have presented, in different cases and states of the disease, nearly every alteration described in the articles on the morbid anatomy of those parts. To these I must refer; but here may add, that the absorbent vessels have been found varicose and otherwise diseased, and the glands in the vicinity of the blood-vessels indurated and enlarged, by MORGAGNI, MORTON, SOEMMERING, HAASE, ASSALINI, BICHAT, MASCAONI, and HODGSON. The frequency of inflammatory appearances in the inner membrane of the arteries, and the presence of ossific deposits in them and in the aorta, have been remarked by HÖFFMANN, FRANK, BADEN, and myself. The respiratory organs, the liver, gall-bladder and spleen, present in different cases all the appearances described in the articles on these viscera. As respects the liver it may be

observed, that those changes and morbid productions which interrupt the circulation through the ramifications of the vena portæ, as remarked by Dr. BRIGHT; also the nutmeg-like state of its substance, obstruction of the branches of the hepatic duct by inspissated bile and cholesterine and calculi in the gall-bladder; are the most common lesions.

13. The next important changes are detected in the kidneys. MORGAGNI gives a case from PICCOLNOMINI, in which one of them being lacerated from the presence of calculi, the urine flowed into the abdomen. RINA, (Schwed. Abhandl. b. xiv. p. 47.) found them scirrhus; and HUELAND met with numerous hydatids contained in cysts formed in their substance. Instances, however, were few, in which disease of the kidneys was mentioned by authors in connection with dropsy, and, when noticed, it was in a very vague and unsatisfactory manner, until Dr. BRIGHT furnished numerous proofs of the frequency of lesions of structure in these organs, and described their various forms, and relations to dropsical effusions. The first form which he particularises, seems to consist of wasting of the structure, and diminished vascularity and firmness, of the kidneys, which are of a yellow mottled appearance externally; their internal structure being also yellow, slightly tinged with grey, and the tubular portions of a lighter colour than natural. They contain no morbid deposit. The change is connected with a cachectic habit of body and debility; the urine being only slightly coagulable. The second form is that in which the whole cortical part is converted into a granulated texture, with a morbid interstitial deposit of an opaque white substance; giving, in its earliest stages, when the tunic is taken off, an increase of the natural fine mottled appearance of the organ; subsequently with innumerable spots strewed over its surface, and distributed throughout its whole cortical substance, and with deficiency of its firmness. At a later period, the granulated texture shows itself externally, occasioning irregular projections of the surface, the organ being generally somewhat enlarged. In the third form of disease, the kidney is quite rough and scabrous, and its surface rises in numerous projections, not larger than a pin's head, of a yellow, red, and purplish colour. Its shape is often inclined to the lobulated; it is nearly of a semi-cartilaginous hardness, and it gives great resistance to the knife. The tubular portions are drawn near to the surface, every part of the organ appearing contracted, and less interstitial deposit being present than in the foregoing variety. Dr. BRIGHT connects these two varieties with craggy urine; and thinks that, as the one appears to pass insensibly into the other, they are commonly grades, or stages of the same change. Besides these, there are other lesions of the kidney found in dropsies: as preternatural softness; obstruction of the tubular structure, by a white deposit resembling small concretions; scrofulous matter infiltrated or deposited in the cortical substance, and in the interstices between the tubuli and, indeed, most of the lesions described in the article KIDNEYS. It is very justly remarked by Dr. J. GREGORY, that disease of these organs is chiefly found in those dropsical patients who are of a strumous diathesis, or who are addicted to

spirituous liquors. The uterus and ovaria often present numerous lesions of structure, but none that are especially connected with dropsy, excepting those accumulations of fluid which sometimes take place in the latter organs, and which can scarcely be considered as a species of this disease. Various morbid appearances are also found in the omentum and mesentery, particularly in *Ascitis*. (See *Dropsy of the Abdomen*.)

14. iv. OF THE CHIEF PATHOLOGICAL STATES OCCASIONING DROPSIES. — The lesions, to which dropical effusion has been imputed in modern times, have been too generally those alterations of structure either preceding or attending it. But although these are manifestly important agents in its causation, yet they are not the only agents, for we very frequently find them in their most fully developed forms without any effusion. Of the numerous remote and pathological causes enumerated above, there is none, which will singly produce dropsy. And, perhaps, in no other disease is a greater concurrence of causes requisite to its appearance, than in this. In recent times, the changes of structure have been investigated, somewhat to the neglect of vital conditions or manifestations; and the former has been too generally looked upon, in respect of the diseases now under consideration, as proximate causes, instead of being viewed as concomitant lesions resulting from anterior changes implicating the functions of life, in one or more of the systems and organs of the frame. The association, however, of these lesions should not be overlooked; and the share which each may have in augmenting or perpetuating the other ought to be kept in view, but with a philosophic reference to anterior conditions.

15. Up to the end of the last century, dropsies were considered as essentially depending upon obstructions or debility; although some among the ancients, particularly *Hippocrates*, admitted the propriety of bleeding in some cases. *Stoll*, *Strak*, *Brambilla*, *Schmidtman*, *J. P. Frank*, and *Gravengesser*, at the epoch now alluded to, inculcated the frequent inflammatory origin of these diseases. *Wells*, *Blackall*, *Abercrombie*, *Stoker*, and *Ayre* followed in the same track; and, excepting a slight disposition to carry this doctrine too far, contributed to the advancement of this branch of medical knowledge. At present it is generally admitted that dropsy may arise from sur-action, or sub-action, — from general or local plethora, as well as from obstructed circulation — from deficient excretion, and from excessive evacuations rendering the blood thin or watery. The numerous changes detected in connection with aqueous effusion, and allowed to favour both it and the accumulation of the fluid, may be resolved into a single proposition, viz. increased exhalation and diminished absorption, which comprises all the views promulgated on the subject, the matter chiefly in dispute being as to which of these changes is the accumulation of fluid chiefly owing. It has been attempted to settle the point by experiment and *post mortem* research. But a matter purely of function — lesions so dependent on vital action and structural cohesion as effusion most undoubtedly is in many cases, however associated, or otherwise dependent upon organic change — cannot admit of a satisfactory elucidation in this manner alone.

16. Those who favour the doctrine of increased exhalation argue, that this change usually follows excited action, or irritation of serous surfaces, or relaxation of the exhaling pores, or this latter state associated with increased action of the larger vessels; that the appearances of the fluid and the constitutional symptoms indicate the existence of excited action; and that absorption is not diminished, is shown by the increasing emaciation attending the effusion, and by the fact of this function being generally augmented with the progress of debility. The believers in diminished absorption contend that, when the agents of this function — either lymphatics or veins — are obstructed, an accumulation of serum takes place in the parts beyond the obstruction; that when plethora, general or local, exists, absorption is diminished, as shown by the experiments of *Magendie* and *Fodéra*; and that, as vascular fulness and action are removed, this function becomes restored to its natural activity. That the balance of function — of exhalation — and absorption — is broken, is very obvious; but the question is, to which is the fault chiefly attributable? It is evident that exhalation preponderates over absorption, in all cases where vital action or vascular plethora is increased; and that, on the other hand, diminished absorption chiefly obtains where the venous or lymphatic circulation is either impeded or obstructed. These propositions are proved by experiment, and confirmed by repeated observation and numerous pathological facts. So that, instead of contending as to which of these functions is chiefly disordered, it would have been more correct to admit that either may be more or less affected in different cases and forms of the disease, according to the states of vital energy and the nature of concomitant organic change. Conformably, therefore, with these facts, rejecting all exclusive doctrines, and following nature as closely as I am enabled to interpret her actions, I believe that dropsy may arise as now stated, as more precisely expressed in the article *Disease* (§ 94.), and as will be more particularly described in connection with lesions of vital manifestation and of structure.

17. In considering the pathological states occasioning dropsy, the conditions of vital action appear equally important with structural change, the more especially as the effusion, even where the latter is the most obvious, depends as much upon the former as upon it; alterations of vital manifestation giving rise to both the change of structure and the effusion, whether or not the effusion be a concomitant or a consecutive result. This consideration has so forcibly influenced the ablest writers, as to induce them to arrange the forms of this disease with strict reference to it. Thus they have been divided into the *acute* and *chronic*, the *sthenic* and *asthenic*, the *tonic* and *atonic*, the *active* and *passive*, the *inflammatory* and *non-inflammatory* or *leucophlegmatic*, and into the *idiopathic* and *symptomatic*, or the *primary* or *secondary* — as they proceed directly from their external causes, or from some visceral disease. These forms are met with in all the seats of dropsy, but in different degrees of frequency. The acute, sthenic, or active state — the effusion consequent upon increased determination and excited action — occurs most frequently in the ovaria and brain, and next in the pleura, pericar-

the exhaling pores, and of the serous and cellular tissues, and to increased tenuity, or alterations of the blood existing independently of any considerable structural change. It is sometimes *caused* by excessive sanguineous evacuations, or exhausting discharges; by the suppression of secretions; and by a deficient, watery, vegetable, or unwholesome diet. The dropsy that sometimes prevails among the poor in times of scarcity is generally of this kind. It is usually *characterised* by a weak, unequal, small, and frequent pulse; paleness of the lips, tongue, and gums; flaccidity of the muscles; anhelation on slight exertion; feebleness of the joints; swellings of the lower limbs, or anasarca attending or preceding the effusion into the cavities of the trunk; an unhealthy appearance of the cutaneous surface; and absence of those symptoms which indicate the existence of visceral obstruction or disorganisation. The urine does not coagulate by heat or acids. This form of dropsy is usually chronic, and is, in adults, most commonly seated in the abdomen, or in the cellular tissue, or in both; sometimes appearing in these situations, particularly the former, after parturition, when it may assume a less asthenic form than that now described. It occurs most frequently in females, and is occasionally associated with hysteria. I have seen it supervene on chlorosis. In infants it usually takes place in the head, and proceeds from constitutional disposition or congenital vice.

23. *B. Secondary or Consecutive Dropsies—Symptomatic Dropsies—Chronic or Passive Dropsies*—are of most frequent occurrence. They are sometimes preceded by inflammatory action; are seldom, however, attended by acute, but often by sub-acute or chronic inflammation, or by active congestion. They are usually of long duration, and frequently the effects of complicated organic change, although generally more immediately dependent upon some specific lesion.

24. (a) *Dropsy from disease of the heart* is always preceded, for a long or indefinite period, by symptoms of disease of this organ. When effusion commences, early evidence of it is presented in the countenance, particularly in the morning, in the eyelids; and next in the feet and ankles, in the evening; or in the hands and forearm, particularly the left. These partial anasarca swellings usually continue a considerable time before signs of the accumulation of water in the chest are manifested, and still longer before any effusion takes place in the abdomen. In some cases, indeed, no fluid is found in this latter situation. The pulse is frequently, but not always, much affected long before any anasarca is observed. When water collects in the face, hands, or arms, after protracted ill-health, and without pulmonary symptoms, disease of the heart may be inferred, notwithstanding the regularity of the pulse: but auscultation will detect its nature. Generally, as the effusion increases in these parts, so symptoms of its commencement in the chest or pericardium, most frequently in both, make their appearance. The patient at first requires his head and shoulders more elevated than usual in bed; and at last he cannot lie down, the effusion increasing in the cellular tissue, and extending to several or to all the shut cavities. In some cases, particularly when the disease of the heart

is of an active nature, hæmoptysis, pneumonia, or pleuro-pneumonia, or congestion, takes place in the lungs in the course of the dropsy, and favours or increases the thoracic effusion. When the cardiac disease consists chiefly of passive dilatation and thinning of the cavities, the effusion is usually also of a passive kind, or attended by vascular and general asthenia, a lowering treatment accelerating a fatal issue. Occasionally the anasarca disappears, or is diminished, for some time before death; but the symptoms of the internal accumulation of fluid become more urgent. When obstruction in the valves of the left side of the heart exists, congestion of the lungs, with sudden increase of the effusion into the pleura, not unfrequently occurs, and terminates life by asphyxy. The urine, in this state of the disease, is often without any albuminous coagulum, or with very little: but it may, or may not, exist even in the same case, at different stages of its course. This form of dropsy is very frequently benefited by treatment, or for a time apparently removed; but it as often recurs, until the progress of the primary lesion, and the exhausted vital energies, at last favour an increased, a more general, or more sudden effusion, often associated with pulmonary congestion, and life is thereby quickly terminated. When the excreting functions are impeded, the effused fluids may, from effete or irritating matters being secreted along with them, act injuriously upon the surface or tissue with which they are in contact; and, in this manner, much of the appearance of irritation or of structural change, observed either in its course or after death, may be superinduced.

25. (b) *Disease of the blood-vessels and lymphatics* is often productive of dropsies; but in many instances its seat and nature cannot be determined during the life of the patient, and frequently with difficulty afterwards.—*a.* The actions of the *arteries* and *capillaries* are more or less affected—are obviously increased in acute, and diminished in passive, dropsies;—but the change is one of function rather than of structure. There are, however, few cases of the chronic or passive forms of the disease met with in advanced age, where the arterial system is entirely devoid of structural lesion. But when we consider the frequency of alterations in this system in old age, it becomes a question, whether it be connected with effusion, otherwise than as both may be coincident results of anterior disorders. Some French pathologists, however, believe that the simple retardation of the circulation, occasioned by structural change in the arteries, favours effusion into the cellular tissue and serous cavities.

26. *β.* In respect of disease of the *veins*, it may be inferred *à priori*, and pathological facts have confirmed the inference, that obstructions of them will occasion dropsical effusions, unless a collateral circulation be established sufficient to prevent extreme congestion of the vessels below the part where the impediment exists. This position, acknowledged since its demonstration by LOWER, has been frequently illustrated by the details of cases. RAIKEM found, in two instances, anasarca of the lower limbs, fibrinous concretions obstructing the vena cava and internal iliac veins. MORGAGNI observed a similar state of the extremities from a tumour which pressed upon these vessels; and attributes, in some cases,

dropsy within the head to pressure upon the superior vena cava. HALLER states, that compression of the jugular veins has produced dropsy of the ventricles and membranes of the brain. LAENNEC found obliteration of the vena cava in a case of ascites and anasarca. I have seen, in two cases, enormous distention of the thigh and leg, from the pressure of a psoas abscess upon the iliac vein; and analogous facts are recorded by HODGSON, D. DAVIS, BOUILLAUD, VELPEAU, MECKEL, and LEE. Organic change about the right side of the heart, or tumours pressing upon the thoracic portion of the vena cava, will obviously produce a similar, but more general effect. And I believe, with several pathologists, that congestion or engorgement of the large veins, from deficient vital power, particularly if it continue for any time, will, independently of mechanical obstruction, be sufficient to occasion both increased effusion and accumulation of fluid; owing—1st, to impeded circulation, consequent dilatation of the smaller vessels, and escape through the pores of a part of their more fluid contents; and, 2d, to diminished absorption; which M. MAJENDIE has shown, by experiment, to exist in parts whose blood-vessels are inordinately congested. If we allow, with this physiologist, and with several others, who have furnished evidence in recent times, that the veins exert an absorbing function, either directly by their radicles, or by lymphatic vessels opening into them, we must necessarily admit that any obstruction, vital or structural, of the venous circulation, will be followed by an accumulation of fluid in parts beyond the seat of obstruction.

27. *γ*. Diseases of the *lymphatics*, both functional and organic, have been viewed, as stated above, as causes of dropsies. It is obvious that little beyond the evidence of analogy can be advanced in favour of impaired function of these vessels: but when we consider that many of them open into veins, without passing through glands, we may admit that they will experience the same modifications of function as those vessels with which they are thus intimately connected. And when we reflect on the various circumstances calculated to retard or to entirely obstruct the circulation in the lymphatics passing through glands, and conveying their fluids into their principal trunks, the admission of impaired function, in some cases, cannot be unreasonable. Of this species of lesion, it is obvious that *post mortem* research can furnish no positive proof: but of structural change direct evidence may be advanced, although the difficulty of obtaining it, even in cases where it may exist, will necessarily diminish the amount. It has been considered by several of the authors mentioned above (§ 26.), that rupture of the lymphatics; by MORGAONI, ASSALINI, BICHAT, SOEMMERRING, &c. that a varicose state of these vessels; by SCHERB and SAVIARD, that concretions formed in their principal trunks; by HAASE, BOYER, HUNTER, CRICKSHANKS, SOEMMERRING, MASCAONI, &c., that compression of either them or their glands; by most of the authorities now named, that obstruction, destruction, or extirpation of these glands; and, lastly, by some of them, that inflammation of the lymphatics, may severally be followed by dropsical accumulations. On the other hand, cases have been adduced by MORTON, D. MONRO, CULLEN, A. COOPER, BICHAT, and LAENNEC, in which the principal lymphatic trunks were ob-

structed without any collections of fluid having been formed.—D. MONRO and M. DUPUYTREN tied the thoracic duct in the lower animals, but dropsy was not the consequence; whilst Mr. CHESTON found it obliterated in a case of anasarca. I therefore infer, that alterations of these vessels either may, or may not, be the principal pathological cause of the accumulation of fluid; that, in respect of these species of lesions, as well as of others, additional changes are frequently requisite to the production of effusion; and that, in many instances where disease of these vessels has been found in connection with dropsy, it has been rather a coincident effect of functional or structural change, or of both, in some vital organ, than the chief source of the collection of fluid. From what has now been stated, it may be concluded, that opinions as to the exclusive operation of any one set of vessels in producing symptomatic dropsies are altogether erroneous, and that either of them may be concerned in the result, more especially the veins.

28. The fluid collected in dropsy from obstruction in the circulation differs from the serum of the blood chiefly in containing much less albumen. It is usually limpid, inodorous, either colourless or of a citron tint; and, in some instances, when the obstruction has occurred suddenly, it is slightly coloured by the escape of a few of the colouring particles of the blood. The parts containing it are commonly free from any material change, excepting in the more chronic cases; and it often collects in very considerable quantity, before much disorder referrible to the accumulation is complained of. The symptoms will necessarily vary with the seat and rapidity of the collection, and the parts primarily or consecutively affected. The diagnosis of effusions depending upon disease of the circulating vessels is very difficult in all cases, and nearly impossible in many. When it occurs in the strumous diathesis, or early in life, or is connected with, or consequent upon, swellings of the lymphatic glands, lesions of the lymphatic system may reasonably be inferred; and when it commences as a local oedema, or is limited to a single limb, or continues in the lower extremities without any signs of disorder referrible to the large cavities, the obstruction of a considerable venous trunk may be inferred. If it appear very slowly in the lower extremities, and increase very gradually, and be attended by a slow, or unequal, or irregular pulse, great coldness of the limbs, with or without discolouration or sores of the legs, particularly in aged or gouty persons, the arterial system will very generally present structural change, as ossific deposits in some part of its course.

29. (c) *Dropsy connected with disease of the lungs*.—Either hydrothorax or anasarca, or both, may occur in consequence of pulmonary affection, or merely as coincident effects of the same cause; and in many instances effusion may take place in the pericardium, in addition to the other forms of dropsy. The acute states of anasarca are not infrequently connected with inflammation, congestion, or hepatization of the substance of the lungs, or with acute bronchitis, particularly after exposure to cold and moisture, or after scarlatina or measles. In many of these cases the pulmonary affection is somewhat obscure, the symptoms being imperfectly developed; and, unless auscultation be used, is liable to be overlooked or mis-

37. v. PROGNOSIS. — The prognosis in dropsies will necessarily depend on their form and origin; on the extent and complication of the structural changes occasioning them, the state of vital manifestations, and the habits and age of the patient. — (a) *Acute* and *sub-acute* dropsies are generally much less dangerous than the symptomatic, particularly when occurring in young persons and in tolerably sound constitutions; but concomitant circumstances, more especially their association with pulmonary disease, and the nature and extent of that disease, will greatly modify the opinion to be formed of the immediate or ultimate result. The form of dropsy which occurs after scarlatina or measles is much more curable than any other. *Asthenic* dropsy, from excessive evacuations or hæmorrhages unconnected with structural change, or that from insufficient or unwholesome diet, generally admits of cure.

38. (b.) *Consecutive* or symptomatic dropsies seldom are permanently removed. Those arising from organic change of the heart may be remedied for a time, but they generally recur again and again; judicious treatment frequently prolonging life, nevertheless, for several years. When the effusion proceeds from disease of the lungs, the prognosis will be formed with strict reference to it; and on the whole, will be less favourable than in the foregoing. The same remark applies to dropsy from changes in the vessels. Accumulations of fluid from organic lesions of the liver are but little under the control of medicine, and generally terminate fatally sooner or later. Occasionally, however, exceptions occur; and much relief is often obtained for a considerable time. When the malady depends chiefly on enlargement of the spleen, a more favourable result has frequently been obtained. Dropsy from disease of the uterus and ovaria seldom terminates favourably. And it would appear that effusions from structural lesions of the kidneys are the most rapidly and certainly fatal.

39. II. TREATMENT. — It will be obvious to every experienced practitioner, that the distinctions made above are merely the more prominent features by which the malady may be recognised, where the acquaintance with it is imperfect; but that there are numerous other shades of character which deserve to be known, and by which he will be in some measure guided in practice, that scarcely admit of description. Of this kind more especially are those ever varying states of vital power, and grades of vascular action, which demand certain indications of cure, or different modifications of treatment, as imperatively as any well-ascertained alterations of structure. There are, perhaps, few diseases that require in the treatment a stricter reference to the conditions of vital power, in connection with changes of its organic alliances, than those now being considered. To ascertain these conditions, and to act strictly in accordance with them in dropsies, even as respects those slighter modifications that can neither be illustrated by examples, nor be made subjects of precept, will tend more to successful practice, than any other object of investigation.

40. I. OF PRIMARY OR IDIOPATHIC DROPSIES.

— A. *Treatment of the Acute.* — The first object of investigation will be the state of the disease in relation to its remote and proximate causes, and of the constitutional powers of the patient, com-

prising every appreciable change in the vital functions, and in the appearance of the soft solids, as indicating modifications not merely in the grade, but also in the kind, of action. By the inferences derived from this source, the practitioner will be guided in the appropriation of the means of cure, and in the alterations he may conceive necessary of the measures about to be described. — In this form of the disease, especially if it be associated with congestion or inflammation of the lungs, if the constitutional powers be unbroken, and if it have appeared suddenly or advanced rapidly, a full *bloodletting* will be requisite, and may even be repeated. In most cases, however, local bleeding by cupping will be preferable to a repetition of the venæsection; and in more doubtful cases, the local depletion, if decidedly employed, will be sufficient. If cupping be prescribed, it should be performed on the part opposite to the seat of soreness or pain, or at a distance from it, particularly when the lungs or pleuræ are affected. Contemporaneously, nearly with depletion, medicine should be taken to act upon the secretions, and equalise the circulation; and, for this purpose, there is, perhaps, nothing superior, in the first instance, to *calomel*, in a full dose, combined with *James's powder*, or with a moderate dose of *camphor*, or with both. In some cases, and particularly in persons who have been addicted to drinking, the *calomel* will be advantageously conjoined with *opium*. In this class of subjects, general bloodletting must be employed with caution. After one or two doses of *calomel*, in either of these states of combination, a *purgative draught* should be exhibited and repeated, and its operation promoted by a *terebinthinate enema*. (F. 149. 151.). Having removed plethora and reduced the increased action, the good effects of *counter-irritation* will be more readily obtained. The ointment of the *potassio-tartrate of antimony* (F. 749.), or the *pea issue*, are upon the whole to be preferred; but they should be employed on the side opposite to that where uneasiness is complained of, or at some distance from the most affected part. Whatever external irritant may be adopted should be long persisted in. In the course of treatment, *calomel*, or *blue pill*, with either *James's powder* or the *potassio-tartrate of antimony*, should be repeated from time to time, until increased action disappear; or be regularly continued, particularly if the pleuræ or pericardium be affected, until the specific mercurial effects become manifest; when *deobstruent* and *saline purgatives* may be prescribed, and their effects promoted by the occasional exhibition of the enema already recommended. The more cooling *diuretics* only should be given at short intervals, in order to promote the functions of the kidneys. These will be advantageously associated with *diaphoretics*. For the former purpose, the *bi-tartrate of potash* with *biborate of soda*, the *acetate of potash*, and the *nitrate of potash* alone, or with *nitric æther*, may be used; and for the latter, the *camphor julep* with *liq. ammoniæ acetatis*, with *vinum antimonii potassio-tartratis*, or *acetum colchici*, and small doses of *opium*. In this form of dropsy, I believe that all heating diuretics, as squills, juniper, *seneka-root*, *horseradish*, with their combinations and preparations, are, more or less injurious, unless vascular action has lapsed into a state different from the *sthenic* form with which it

cerned in the production of effusion, especially those which impede or interrupt their functions. Of this latter kind seem to be the principal of those so well described by Dr. BRIGHT (§ 13.). Dropsy may arise either from disease of the kidneys alone—which seldom occurs, and in which case it usually commences with anasarca, at first affecting chiefly the lower extremities—or from lesions of these organs associated with those of the heart, or of the lungs, or liver. In such complicated cases, the disease of the kidneys may be either *primary* or *consecutive*; perhaps, more frequently, the latter.—*a.* When it is *consecutive*, the dropsy commences, as already described, in alterations of either the circulating or respiratory systems; the accession of the affection of the kidneys being often distinctly indicated by pains in the loins, sickness, vomiting, occasionally purging, and coagulable urine. In some instances, however, renal disease may exist without these symptoms being prominent; and coagulable urine may be present without the kidneys being particularly implicated.—*β.* When the renal affection is the *primary* alteration, the dropsy commences as anasarca; but rapidly extends to the cavities of the pleuræ and pericardium, of the peritoneum, and not infrequently of the arachnoid. In most of these cases, the symptoms are more acute, and the progress of the disease more rapid, than in any of the other forms of symptomatic dropsy. This seems attributable to the disease of the kidneys being such as prevents them from removing all, or even a large proportion, of the injurious elements constantly requiring elimination from the blood; to the consequent secretion of a portion of them in the accumulated fluid; and to their imparting irritating properties to it; whereby it induces inflammatory action in the serous surfaces containing it, with rapid aggravation of all the phenomena, and occasionally a concentration of the malady in one or more of its usual seats. Thus, it is not uncommon to perceive symptoms of pleuritis or pericarditis, or even of peritonitis, to accompany, or even to precede, the more advanced periods of the effusion into the respective cavities; and, as the disease is increased in one or more of these, to observe the disappearance of the fluid from the extremities. In some instances, where the collection has formed rapidly in the cavities of the chest, either preceded or attended by acute symptoms referrible to this situation and its contained organs, not only the anasarca, but also the ascites, where one or both have previously existed, has partially or nearly altogether disappeared, the rapid effusion into these situations soon terminating existence. In other instances of this form of dropsy, effusion on the brain is superadded to these, and the patient dies comatose. Dr. BRIGHT and Dr. GREGORY remark, that there is great proneness to salivation from small doses of mercury in dropsy from diseased kidneys.

35. (*f*) *Dropsy from disease of the uterus and ovaria* may arise either from the pressure they produce, when enlarged, or containing tumours, on the veins and lymphatic glands and vessels; or from the extension of disease from them to their peritoneal covering. I met with a case, in which ascites was consequent upon chronic inflammation of the uterus, the peritoneum covering the fundus having become consecutively affected; and a nearly similar instance, in which the effu-

sion into the peritoneum was owing to the suppression of leucorrhœa by astringent injections. In this latter case, I inferred that the discharge proceeded from inflammatory irritation of the internal surface of the womb, or of the os uteri, and that the treatment had suppressed the morbid action in these situations, and determined it to the fundus and peritoneal surface; whence it had extended further, and produced effusion into the abdominal cavity. But little anasarca was present in these cases, and that was confined chiefly to the feet and ankles. Ascites may probably likewise follow chronic inflammation of the ovaria, owing to a similar extension of the irritative vascular action to the peritoneum. Excessive hæmorrhage from the uterus, and abortion, may also produce dropsy, as stated above (§ 8.). Those diseases which have been generally described as ovarian and uterine dropsies, are purposely excluded from the present view of the subject.

36. *Of the Urine in Dropsies.*—Owing to the attention that has been paid to this topic in modern times, and particularly since the investigations of WELLS, BLACKALL, PROUT, and BRIGHT, the state of this secretion has become an important source of information as to the pathological conditions giving rise to dropsical collections; although, when viewed alone, much less dependence can be placed upon it. Dr. WELLS found that the urine was more or less coagulable in the dropsies consequent upon scurvy, and even from the exhibition of mercury; and that this symptom was most frequent in anasarca, it having been remarked in twenty-four cases out of thirty-seven. Dr. CHRISTIAN and Dr. I. GREGORY also remarked it most common in this form of dropsy; and my experience accords with theirs. I have seldom seen it in ascites. Dr. BLACKALL considered it as an attendant upon the acute form of the malady; Dr. PROUT, as an indication of irritation. Dr. BRIGHT's cases prove its connection with the more advanced states of the changes of the kidneys he has described, independently of the existence of acute or sthenic vascular action. Several physicians have remarked this state of the urine in other diseases, unconnected with lesions of the kidneys; but admit its frequency in certain circumstances, as well as in acute dropsies. I have often observed it in acute diseases of children, where no alteration of the kidneys existed, and I believe it is not uncommon after the exanthemata. The above writers have also noticed a less specific gravity of albuminous than of healthy urine. As to the dark brown colour which this urine frequently presents in dropsy, the inference of Dr. BRIGHT, that it arises from the red globules of the blood, seems to be correct. The presence of albumen may be ascertained either by boiling, or by the nitric or hydro-chloric acids, alcohol, the ferro-prussiate of potash, or bichloride of mercury. The last re-agent is, perhaps, the whole, the best. The opinion of Dr. PRICHARD, as to the value of albuminous urine as a symptom, will be adopted with advantage; namely, that we ought always to be aware of its presence, as, taken along with the others, it may be occasionally useful in directing our judgment as to the nature of the disease; but that, in the present state of our knowledge, it does not indicate any particular remedy or mode of treatment.

commenced. With this impression, I have usually preferred those that are the most sedative and refrigerating, especially foxglove, colchicum, the wine of tobacco in small doses, and the spiritus ætheris nitrici, as long as any evidence of increased action remains.

41. *B. Of Sub-acute Dropsy.*—Those intermediate states of the disease, between the acute and the passive—between the sthenic and asthenic forms—will necessarily require means appropriate to the grade of action they may evince. In the more acute cases, local depletions, and the rest of the treatment described above, will be most efficacious. In these, the judicious exhibition of derivatives and purgatives, followed by diaphoretics and diuretics, constitute the chief means of cure; and, when this state of the disease occurs after scarlatina or measles, or in connection with bronchitis, digitalis, the preparations of antimony with opium, and the warm or tepid bath, in addition to these medicines, and followed by change of air, will prove of essential benefit. In the more sthenic cases of the sub-acute, as well as in the acute, disease, when it arises from suppression of the perspiration, or of the exanthemata, the warm or tepid bath, or medicated baths, consisting of emollient decoctions, &c., or containing the sulphuret of potassium, or the carbonate of soda or of potash, will be serviceable, when employed after sufficient sanguineous and alvine evacuations. In the less active states of the disease arising from the same causes, particularly from suppressed eruptions, the application, and, occasionally, the repetition, of a large blister, or of mustard poultices, or of warm terebinthinate epithems, at a distance from the seat of effusion, or of irritative action, where the existence of this latter is inferred, will frequently be productive of benefit. In those cases which approach the passive or asthenic character, or in such of the above which may lapse into it, owing to neglect of treatment, or to a too active treatment relatively to the nature of the case, or to constitutional fault, the means that will be advised for the form of the disease which is thus characterised (§ 42.) should be employed. It will sometimes occur, especially in the intermediate or more doubtful cases, and even also in the acute, that the more antiphlogistic means will be productive of little or no benefit, or will even appear to aggravate the symptoms, although their exhibition seemed clearly indicated. I have generally observed that the practitioner has been misled by the great frequency of the pulse, which he has mistaken for a sign of increased or sub-acute action, instead of viewing it, when it is at the same time soft, small, and easily compressed, and when it is connected with other signs of depression of vital power, as evidence of great weakness conjoined with increased irritability of the vascular system. In such circumstances, I have found gentle tonics and astringents, with *deobstruent laxatives*, or with alkaline sub-carbonates; and the moderately stimulating diuretics, more especially the balsamic and terebinthinate preparations, with camphorated opiates, &c.; and, if the pulse be languid, with frictions actively, long, or frequently employed; prove very beneficial. Sub-acute or acute dropsies, appearing after the suppression of the hæmorrhoidal discharge, require, after moderate blood-letting, the active exhibition of *hydragogue purgatives*; and the same states of disease connected

with suppressed menstruation are most benefited by a nearly similar treatment, with the addition of the *bi-borate of soda*, continued regularly for some time. In some cases of the less sthenic state of sub-acute dropsy, the internal and external use of the *nitro-hydro-chloric acids*; or a well-regulated course of Bath waters, with frequent changes of air; and in others, the artificial waters, of Carlsbad, Ems, or Marienbad; and where the bowels require frequent assistance, the *Seidchut waters*; have proved very serviceable.

42. *C. Treatment of Asthenic or passive Dropsies.*—In cases where the debility is general, at the same time that vascular action is either languid or weak—notwithstanding that the pulse is frequent—and the vital cohesion of the cellular and serous tissues is diminished, tonics with the *mineral acids*, especially the infusion of cinchona or the sulphate of quinine, should be prescribed. Where a cachectic habit of body is manifest, quinine will probably occasion heat and feverishness. In such cases, it will be necessary to associate the vegetable tonics with *deobstruent and laxatives*; to exhibit the blue pill or PLEMER'S pill, in small and frequent doses, with *taraxacum*, or the compound decoction of *sarsaparilla*, the mezereon having been left out. In many of those doubtful cases of this form of the disease, where it is difficult to determine whether it is primary, or associated with obscure lesions in the secreting substance of the liver or kidneys, some advantage will be derived from minute doses of the *bichloridum hydrargyri*, in large quantities, of the decoction of sarsaparilla, or of any of the species of the *similar*. I have likewise, in such circumstances, found great service from *iodine*, particularly the iodide of potassium and the iodurated solution of the iodide, in smaller and much more frequent doses than are usually directed.

43. When this form of dropsy has arisen from excessive losses of blood, or has supervened on chlorosis, the *chalybeate preparations*, with chalybeate mineral waters, or the artificial Pyrmont and Spa waters, will be of the utmost service. But care should be taken to ascertain the non-existence of visceral obstruction before they are resorted to, and to preserve the bowels freely open during their use. When passive dropsy occurs after delivery or abortion, bitter infusions, and vegetable tonics, the decoction of cinchona with mineral acids, occasional purgatives, and the terebinthinate enema, with frictions of the surface and bandages, will be requisite, and, if it be accompanied with hysterical symptoms, the preparations of juniper, spirit. ætheris nitrici, or other ætherial preparations, with tinct. camphoræ comp., or small doses of opium, will be of much service. In these cases, the combination of diuretics with bitter or tonic infusions, and small doses of the tinctura camphoræ Thebæacæ (F. 708.), or the tinct. opii camph. (F. 728.) will generally be advantageous.

44. ii. *TREATMENT OF CONSECUTIVE OR SYMPTOMATIC DROPSIES.*—It is obvious that the intentions of cure in this class of dropsies should have strict reference to the nature of the organic lesions concerned in the production of effusion, and to the state of vital energy and structural cohesion; and that they should comprise the following objects.—1st. To remove these lesions, and if this cannot be accomplished, to retard their increase, as the chief means of diminishing the

effusion;—2d. To promote the absorption of the fluid accumulated;—and, 3d. To support the constitutional powers; as being necessary both to the due operation of remedies, and to the exertion of that vital resistance which guards the structures against the impression of hurtful agents, whether generated within the system, and acting intrinsically, or invading them from without.

45. *A. Of dropsy consequent on disease of the heart.*—It will be important to ascertain, as correctly as the rational and auscultatory signs will enable us, the nature and seat of the cardiac lesion, in connection with the seat of effusion, and its characters in respect of activity. If obstruction to the circulation be seated in the left side of the heart, there will very probably be associated with the effusion, congestion of the substance of the lungs, which will aggravate the hydropic symptoms, and render depletion the more necessary. Also, if the cardiac disease consist, either altogether, or in part, of active enlargement of the parietes of the cavities, the dropsy will present a sthenic character, and require antiphlogistic remedies; but if the lesions be chiefly passive,—if there be dilatation with thinning or softening of the parietes of the heart,—the constitutional symptoms will possess analogous features, and the disease require an opposite—a tonic, treatment. It will be evident from these facts merely, that, in symptomatic, as well as in idiopathic, dropsy, and even in that connected with impeded circulation through the heart, the strictest reference should be had to the state of vital power and vascular action, as the principal basis of our intentions of cure.

46. If a state of sthenic action exist, *local depletion*—preferably by cupping; hydragogue cathartics, as *elaterium* and the *croton oil*, repeated from time to time; or even these independently of depletion; and subsequently the use of *diuretics*, or these at an earlier period where the active and repeated exhibition of purgatives are not well borne; will frequently remove the accumulation of fluid. In this state of the disease, *digitalis* is the most efficacious diuretic, especially after local depletions and purgatives, in the more sthenic cases. Debility rather indicates, than contradicates, the propriety of resorting to it. The infusion is the most certain preparation of this medicine. Half an ounce of it two or three times a day, as usually directed, is a much larger dose than that recommended of its other preparations; hence the reason of its activity, its diuretic operation being heightened by the addition of small doses of opium. If a tensive pain in the forehead, with disturbance of the cerebral functions, come on early after its exhibition, it will rarely be of service, or it may even be injurious, as remarked by Dr. BLACKALL, and it, therefore, should be immediately relinquished. When there is much debility, it should also be discontinued upon the first appearance of an increase of the urine. But even great debility is no reason against the use of this medicine, as Dr. WITHERING has shown; only the more caution is required in its exhibition. In such cases I have usually combined it beneficially with camphor, a small quantity of opium, or with cinchona (F. 859.), and other vegetable tonics and cordials, or with F. 708. or 728. *Colchicum* is sometimes of service when this form of dropsy assumes a

sthenic character, or appears in the rheumatic or gouty diathesis; but it requires much caution. It is most safe, and at the same time most serviceable, when combined with camphor or ammonia, or with the alkaline carbonates, and infusion of cinchona.

47. When the cardiac disease and its consequent effusion are of a passive kind, and especially if the constitutional powers are much reduced, a tonic treatment, in conjunction with stimulating diuretics, is requisite. The remedies of this description, already recommended (§ 43.),—the infusion of quassia, with the tincture of the sesquichloride of iron, and tincture of digitalis; the compound infusion of angelica (F. 219.); the decoction of broom tops (F. 75.), with the compound spirit of juniper; the compound decoction of taraxacum (F. 77.), with tincture of calumba or the potassio-tartrate of iron; and either Formulæ 570. 781. 859., or the following, will often be prescribed with benefit:—

No. 179. R Potassæ Carbon. ʒj.; Tinct. Cinnamom. Co. 3j.; Spirit. Æther. Nit. 3j.; Infusi Gentianæ Comp. 3j. (vel. Decocti Scoparii Comp. 3j.); Aquæ Anethi 3ij. M. Fiat Haustus ter quotidie sumendus.

No. 180. R Potassæ Acetatis 3ss.—ʒij.; Tinct. Digitalis M viij.; Tinct. Opii M v.; Spirit. Junip. Comp. 3j.; Infusi Quassiae 3ix.; Aquæ Pimentæ 3ij. M. Fiat Haustus ter quaterve in die sumendus.

No. 181. R Camphoræ subactæ, Gualaci Resinæ, ʒā 3j.; Pulv. Scillæ et Pulv. Digitalis ʒā gr. xv.; Opii Puri gr. v.; Olei Juniperi M xxij.; Mucilag. Acaciæ q. s. M. Contunde simul, et distribue massam in Pilulas æquales xlviii., quarum capiat binas ter in die.

No. 182. R Tinct. Digitalis M x—xv.; Liqueur Ammoniac Acetatis 3ij.; Infusi Cinchonæ et Mist. Camphoræ ʒā 3vj.; Tinct. Camphoræ Comp. 3j.; et Spirit. Anisi 3ss. M. Fiat Haustus bis quotidie sumendus.

48. *B. Dropsy from disease of the absorbing systems—veins and lymphatics.*—The difficulty of determining when the effusion is owing to these causes has been stated above, with such signs as sometimes indicate its existence (§ 25. et seq.). In the more limited states of anasarca, and even in ascites, bandages and frictions, assiduously employed, with the internal exhibition of the iodide of potassium, or of the other preparations of iodine to be found in the Appendix (F. 234. 723.), have proved exceedingly beneficial in some cases in my practice. The decoction of broom tops with liquor potassæ, or this latter in the compound decoction of sarsaparilla; equal quantities of the bi-borate of soda and bi-tartrate of potass in the decoctum cydoniæ, or decoctum guaiaci comp.; the diuretic drinks, in the Appendix (F. 588. et seq.); and frictions with deobstruent liniments (F. 295. 297. 311.), will occasionally be of much service. The carbonate of soda, or nitrate of potash, or both, exhibited in tonic infusions, to which small doses of digitalis are added; and the infusion of berberis, or the compound decoction of taraxacum (F. 76, 77.), with carbonate of potash or of soda; or the same alkaline carbonates with the infusion or mixture of the diosma crenata (F. 231. 396.); may likewise be employed, with a prospect of advantage, from their deobstruent operation. In all cases of this kind, gentle exercise in the open air; the use of the artificial waters of Marienbad, and Eger, or of Seltzer or Seidenschütz; and strict attention to a moderate, digestible, and cooling diet; will prove of essential benefit.

49. *C. Dropsy connected with pulmonary diseases.*—The treatment in this complication should mainly depend upon the character of the vascular

combination to those in which rhubarb is appropriate (see F. 231. 396.). The *marchantia hemispherica*, or liverwort, has been recently employed with much benefit by Dr. SHORTT, in cases where other remedies had been employed without advantage. He has, however, found but little service from its internal use, and has employed it chiefly externally as a poultice. For this purpose it is first boiled, afterwards beat into a pulp, and mixed with as much linseed meal as will bring it to the consistence of a poultice, which is spread upon flannel, and applied warm over the seat of the effusion, repeating the poultice every twelve hours, until the accumulation of water is removed. It produces "copious perspiration, and at the same time acts powerfully on the kidneys." The sinking sensation it sometimes occasions is relieved by the *spiritus ætheris nitrici*. The effects of this application are stated to be increased by allowing the patient warm and nourishing diluents, and beef tea, &c. Dr. SHORTT believes that this application will be found to succeed in many cases where the kidneys are affected. The bark of the root of *cichorea racemosa anquifolia* has been lately employed by M. LEMASSON. This bark furnishes a crystallisable principle, of a bitter and astringent taste, soluble in water and alcohol, in which the virtues of the plant reside. A decoction of two drachms of the bark in eight ounces of water is divided into two doses, which are taken with an interval of two hours. This generally affects the kidneys, and the action continues for some days. As soon as its action begins to diminish, the same doses are repeated. It is suitable only to the asthenic states of the disease.

81. *Cantharides* have been recommended in dropsies, on account of their diuretic action, by HIPPOCRATES, GALEN, DIOSCORIDES, and others among the ancients; and by BRISBANE, FARR, and several modern writers. HOFFMANN, WERLHOFF, and HUFELAND, gave them with cream of tartar, the tartaric acid, or nitrate of potash, and with camphor; and TULPIUS in the form of tincture with *spiritus ætheris nitrici*, cardamoms, &c. They should be exhibited with great caution, and only in the most asthenic forms of the disease. Dr. GROENEVELT, a licentiate of the College of Physicians, was committed to Newgate in 1693, by the president and censors, on the plea of *mala praxis* for prescribing them in diseases of the urinary organs, although numerous authorities in support of the practice could have been adduced. *Cantharides* act upon the kidneys, and upon the capillary system, chiefly from the absorption of their active principle, which has been termed *canthariden*.

82. The *æthers* also act upon the kidneys, especially the *spiritus ætheris nitrici*, and *spiritus ætheris sulphurici*. They are useful chiefly as adjuvants of other diuretics. The sweet spirit of nitre is, however, an active diuretic when judiciously combined, or when given while the patient can take exercise in the open air (see F. 169. 195, 196. 397.). It may be remarked generally respecting the use of diuretics, that the addition of small doses of opium, or of the *tinctura opi comp.* (F. 728.) as advised by HUFELAND and PARIS; and of out-door exercise, as directed by TISSOT; will much augment their operation. Many of the Continental writers ad-

vise them to be taken in *malt liquors*—a vehicle which certainly promotes their action, and is not inappropriate in the asthenic forms of the disease. It is in these forms principally that Dr. RUSH conceived that any advantage was derived from this class of medicines; and DECKERS, FRIZE, MURSIMA, and MAGENNIS, seem to have been of nearly the same opinion, they having recommended them to be given with tonics.

83. *D. Emetics* have been employed by several authors, particularly by SYDENHAM, LILLIE, J. P. FRANK, and PERCIVAL, chiefly after other medicines had failed; and some advantage has been said to have accrued from them. Squills are the emetic most commonly employed, which probably are partially absorbed, and act also as a diuretic. Several writers have mentioned instances of the disappearance of dropsy after spontaneous vomiting; and have looked upon this circumstance as an indication for exhibiting emetics. They are scarcely ever used in modern practice, and probably the cases are few in which they are indicated. I have seen, however, instances wherein obstinate vomiting supervened apparently upon the medicines which had been exhibited as diuretics, particularly digitalis, squills, and colchicum; but the good effect that appeared in these cases was attributable to the preceding course of medicine, and to the accumulated effects of these substances upon the system.

84. *E. Diaphoretics and sudorifics* have been recommended by most writers. But in the majority of cases, particularly in the acute and plethoric, there is great difficulty in producing perspiration; the means which are employed, unless they be of a contra-stimulant or relaxing nature, tending rather to excite the vascular system, and to increase the morbid exhalation, than to relax the surface, and produce diaphoresis. The *potassio-tartrate of antimony*, *Dover's powder*, and *spiritus ætheris nitrici*, are, perhaps, the best sudorifics that can be employed; but the former should be given, in the acute cases, so as to occasion some degree of nausea; and the last named, in asthenic cases. *Dover's powder* was much confided in by MUDGE, and *guaiacum* by CHAMBERLAINE and BRÜCKMANN. As to the propriety of resorting to *warm bathing*, in order to induce perspiration, much difference of opinion has existed. Tepid baths were recommended by STOLL and FRANK, in the acute states of the disease, and *vapour baths* by DARBEY and others.

85. *F. Mineral waters*, if judiciously directed and brought in aid of medicine, are often productive of much benefit. ZACUTUS LUSITANUS recommends the internal use of *sea water*; and there can be no doubt that it will prove beneficial if persisted in, particularly in the sub-acute and atonic states of the disease. In the more asthenic forms of dropsy, the *Bath waters*, the mineral waters of *Carlsbad*, *Ems*, *Marienbad*, and *Vichy*, and those of *Seltzer*, are often serviceable. In cases depending chiefly upon obstruction, and where an aperient action is desired, the waters of *Harrogate Moffat*, and *Leamington** may be tried.

* Dr. LOUDON, of Leamington, favoured the author with the results of an extensive series of experiments made to ascertain the composition of these waters. There are eleven springs of mineral water, seven of which are purely saline, three sulphureous, and one chalybeate. The saline contains .098 cubic inches of oxygen, .763 of azote, 3.156 of carbonic acid, 34.435 grains of sulphate of

tioned above, or from the suppression of an accustomed discharge, or of some eruption; and often advances rapidly, with symptoms of inflammatory or excited action in the peritoneum, — with pain, tenderness, and sometimes tension of the abdomen; a quick, small, hard, or wiry pulse, and suppression or diminution of all the secretions and excretions. Either consecutively on, or concomitantly with, these symptoms, fullness of the abdomen is observed, which usually augments rapidly. At first the increase is most remarkable in the lower part of the abdomen and iliac regions when the patient is sitting up, and the liver is not enlarged; but it is always diffused when the patient is in the supine posture, and without any limitation or tumour. Upon examining the abdomen by percussion, a somewhat dull sound is emitted, and the examination occasions pain. The surface of this cavity is generally dry or harsh, warmer than natural, and more tender to the touch; and fluctuation is very easily perceived by placing one hand, or the index finger, upon the anterior part of either iliac region whilst the patient is erect or sitting up, and striking gently, at a little distance, with one of the fingers of the other hand. According to M. TARRAL, a slight effusion will be detected, and the nature of the disease made evident by this means, long before it reaches the height that can be recognised in the usual way (See ABDOMEN, § 16.). As the accumulation augments, all the abdominal functions are more and more disturbed; and at last respiration becomes difficult, from the pressure of the water upon the liver and stomach, and the impeded descent of the diaphragm; and the patient is unable to lie down. The abdomen is now large and prominent in its upper regions, and pushes, particularly in young subjects, the ribs and cartilages upwards. Irritability of stomach, anxiety, restlessness, want of sleep, great quickness of pulse, sometimes delirium, and ultimately coma and death, supervene, if temporary or more prolonged relief be not obtained from treatment.

93. (b) The *sub-acute form* of ascites is milder in its character and slower in progress than the foregoing; and, as well as the acute, is not an infrequent sequela of scarlet fever, and more rarely of measles; but is, in such cases, always attended by more or less anasarca. When it thus occurs, it usually appears gradually, and commences from seven to fourteen days from the disappearance of the eruption, commonly with a recurrence of the febrile symptoms, quickness of pulse, dryness of skin, thirst; loaded, white, or furred tongue; and diminution or interruption of the secretions. All the phenomena increase more gradually, however, than in the acute; and are more readily controlled by treatment. In both these forms of ascites, the urine is scanty, often pale, and always contains more or less albumen. The face is generally oedematous in the morning, and the ancles in the evening. In other cases of the sub-acute variety, the effusion takes place upon the disappearance of some acute disease, either attended by free discharges, or treated by copious depletions; frequently with febrile symptoms, and always with interruption or diminution of the natural secretions, the fluid parts of the blood being discharged by the increased determination to the peritoneum. In

both the *acute* and *sub-acute idiopathic forms* of ascites, the accumulation of fluid arises from increased exhalation — *hypercrinea* of the peritoneum, according to the phraseology of M. ANDRAL — the result either of morbidly excited vascular action, or of increased determination of blood, conjoined with a relaxed or weakened state of the exhaling vessels and pores.

94. (c) The *asthenic, or passive, state* of idiopathic ascites is the most rare. It occurs chiefly after profuse hæmorrhages and evacuations, in chlorotic females, or shortly before puberty, in ill-fed persons, living in cold, low, or damp localities; and in those who are excluded from the solar light, or are under the influence of the depressing passions, and are employed in sedentary occupations. It usually commences with, or is preceded by, oedema of the ancles, feet, and legs. It proceeds very slowly; and is attended by general debility; cold extremities; a pale and sickly countenance; a cold or cool skin; a weak, small, quick, or fluttering pulse; pale or loaded tongue; diminished or vitiated appetite; various dyspeptic symptoms; and by chlorosis or hysteria in females, amongst whom this variety is most frequent. The urinary secretion is more copious, and the bowels more irregular, and more readily acted on by purgatives, in this than in the other forms. Whilst lowering measures benefit the two preceding, they aggravate this variety of the disease (see § 102.).

95. B. *Consecutive, or metastatic ascites*, occurs in either of the *acute* or *sub-acute states* described above; more frequently the latter (§ 93.), when there has been no suppression of the disease on which it is consequent; but when any of the febrile exanthemata have been prematurely driven from the surface; or when the patient has been exposed to cold or moisture, or both, during convalescence; or if it have supervened upon erysipelas, rheumatism, or gout; the acute or sthenic condition is most common. It is much less acute, if it have supervened upon inflammation of some parenchymatous or adjoining organ; or if it accompany pregnancy. In other respects the characters and progress of the disease are the same as those stated in respect of the idiopathic varieties.

96. C. The *symptomatic, or complicated, states* of ascites are the most common; and, like the primary or idiopathic, present every grade of activity and acuteness. But whilst, in the latter, the acute and sub-acute are most frequent, in the symptomatic, the asthenic state predominates, although an irritative form of inflammation is sometimes observed to occur in the course of the disease, often, probably, owing to the irritating properties of the effused fluid, as shown above (§ 34.). Complicated ascites presents many of the organic lesions that occasion symptomatic dropsy (§ 12.); most commonly structural changes in the liver, or vena porta; in the spleen; in the mesentery and its glands; in the kidneys; in the uterine organs; and in the veins and lymphatics. The dropsical collection appears after a longer or shorter period of disease referrible to these organs; commences imperceptibly, and proceeds slowly, and generally without febrile symptoms and towards the fatal close of the disease. Frequently oedema begins in the feet, and extends upwards to the knees, thighs, scrotum, or hips,

instances, the urine has a brown appearance, from the presence in it of some of the red particles of the blood. FRANK likens it to the washings of flesh, owing to this circumstance. It generally coagulates more or less on the application of the usual re-agents.

126. In the less favourable cases *symptoms of danger* appear from the third to the ninth day from the commencement of the oedema of the face; but after twelve or fourteen days, they very seldom occur; convalescence often, under a judicious treatment, having commenced or proceeded far by this time. The danger in this form of anasarca depends upon its complications.—

1st. Upon active congestion, inflammatory action, or serous infiltration of the substance of the lungs, as in the primary form of the disease (§ 122.); dyspnoea, sense of oppression, constriction and anxiety in the chest, with dry cough and inability to lie down supervening, and indicating the nature of the complication:—2d. On effusion on the brain, ushered in by headach, sickness, and vomiting; and evinced by dilated pupils, slow pulse, convulsions, strabismus, loss of sight, and other signs of acute dropsy of the brain:—3d. On effusion into the pericardium, indicated by swellings of the face, neck, and hands, fulness of the veins of the neck, bloated countenance, irregular pulse, leipothymia, and fulness and tenderness of the intercostal spaces, chiefly of the left side:—4th. On effusion into the pleuræ, sometimes also associated with some effusion into the pericardium, and the symptoms of hydrothorax:—and, 5th. On disease of one or more of the abdominal viscera, either with or without effusion into the peritoneum; severe diarrhoea or dysentery occurring, and, whilst it carries off the dropsy, causing a chronic disease of the digestive mucous surface, occasionally with ulceration and its consequences; or suppression of urine from congestion or inflammation of the kidneys taking place, and aggravating all the dropsical symptoms; or obstruction of the liver superinducing an obstinate and dangerous form of ascites.

127. Anasarca consecutive of scarlatina is most frequent in children, and is rare in adults. Other eruptive diseases, beside this, give rise to dropsy of the cellular tissue, especially measles, erysipelas, urticaria, miliary fever, and many chronic diseases of the skin; owing not only to their suppression or retrocession, but also to impeded secretion, and to the consequent excrementitial plethora often attendant, or consequent, upon them. When it is consecutive of these diseases, it possesses either the sub-acute character common in that following scarlatina, or the more acute symptoms of the primary form.

128. *C. Primary asthenic anasarca* is not so frequent as the preceding. It is even questionable whether or not the asthenic cases, usually considered as idiopathic, are not depending either on structural change in an important emunctory, as the kidneys, or on obstruction about the right side of the heart, or congestion of the large veins and of the lungs. There can be little doubt that many of them are thus connected; yet some instances will present themselves, in which the asthenic state is primary, as far as can be ascertained. These are most likely to occur in persons living in cold, miasmatic, moist, low, imperfectly ventilated, and dark places; particularly in

those of a lymphatic or phlegmatic temperament, or who lead sedentary lives, and are insufficiently nourished; in those who have experienced copious losses of blood, or are reduced by chronic or repeated discharges, as by hæmorrhagia, diarrhoea, dysentery, &c., or who, whilst convalescent from severe exanthematous or other fevers, have been exposed to cold and humidity; and in persons under the influence of depressing emotions, or who have suffered some sudden alarm. This form of the disease may accompany retention of the menses, or chlorosis; and it may supervene also, in debilitated states of the frame, upon obstructions of the catamenial or hæmorrhoidal evacuations. Many of such cases, however, will approach very nearly to the sub-acute form, and derive benefit from evacuations. The cases of anasarca produced by terror, disappointment, surprise, mental distress, &c., and termed spasmodic by LANDRÉ BEAUVAIS, and some other writers, appear to belong chiefly to this variety. That these and similar causes are sometimes followed by anasarca, cannot be disputed; but I question the dependence of the disease on spasm. Even granting the existence of spasm, what are the parts affected by it, and how does it act? Convulsions will sometimes occasion oedema of cellular parts; but, they will also, during their continuance, sometimes remove the effusion, as observed by Dr. WELLS. The causes which are supposed to act by spasm, merely derange or impede the circulation through the heart and lungs, occasionally also rendering the hepatic circulation more languid or difficult than natural, whilst they lower the vital tone of the extreme vessels, particularly in weak and irritable constitutions, and interrupt the excretory functions, thereby inducing the conditions of the vascular system most favourable to the occurrence of serous effusion. Cases rapidly produced by fright have been recorded by TISSOT, DESESSART, BEAUCHÊNE, BRESCHET, BATEMAN, and others; and numerous instances connected with disordered or delayed menstruation, and the exhausting diseases mentioned above, have been adduced by PLATER, RIEDLIN, FORESTUS PISO, WILLIS, ELLER, HOFFMANN, SAUVAGES, LEIB, MELITSCH, and later writers.

129. Asthenic anasarca generally appears slowly, and with all the signs of debility and laxity of the soft solids: whilst the sthenic disease often forms rapidly, and with many of the symptoms of fever, or increased action. The infiltration usually commences in the lower extremities; sometimes in the face, or in both; slowly extends over more or less of the body; and is most remarkable, as well as most early, in those parts of the cellular tissue which are the most lax, as the eyelids, genitals, &c. The pulse is small, soft, and occasionally slow; the skin becomes paler, whiter, and colder than usual. The surface pits much more easily on pressure, and retains the impression longer than in the acute or sub-acute forms. At first, the infiltration of the lower extremities is most remarkable at night, and nearly disappears in the morning; but it subsequently returns earlier in the day, and to a greater extent, and is incompletely or partially dispersed by the horizontal posture; the reverse taking place as to the oedema of the face. Ultimately it becomes much more con-

siderable, more general, and more permanent, sometimes with signs of coincident or consecutive effusion into one or more of the serous cavities. But the collection is very rarely so great, or so complicated, in primary asthenic anasarca as in the symptomatic. The urine is in small quantity, and seldom contains albumen. The bowels are either sluggish or irregular; more commonly the former.

130. *D. Symptomatic anasarca* may present either acute, sub-acute, or chronic characters. But it is most frequently chronic, passive, and asthenic, and nearly resembles the primary asthenic variety now described, as respects the constitutional powers. When, however, anasarca is complicated with, or consecutive on, *acute diseases of the lungs* (§ 29.), it is also acute or sub-acute; but it is rather, in this case, a concomitant effect of the exciting causes of the pulmonary disease, than a symptomatic affection. Organic changes of the heart and kidneys are the most frequent sources of symptomatic anasarca. I shall, therefore, notice this complication more closely than the others.—(a) *Anasarca* generally supervenes on *chronic lesions of the heart*, and especially towards the close of life; usually commencing in the face, particularly in the eyelids, and upon rising in the morning. Sometimes the ancles begin first to swell, and occasionally both the face and ancles—the former in the morning, and the latter in the evening. The infiltration gradually increases and extends; effusion into the pleuræ, or into the pericardium, or into both, also taking place either simultaneously or subsequently.

131. (b) *Anasarca* caused by *disease of the kidneys* is very seldom seen unassociated with effusion into one or more of the serous cavities. It is, when thus complicated, attended by pain in the loins, by sickness, vomiting and diarrhœa: it usually commences in the lower extremities; and is commonly in consequence of irregular and drunken habits, or of the scrofulous diathesis. It is very liable to recur, and is seldom permanently removed (§ 34.). *Anasarca* is also sometimes a consequence of chronic disease of the lungs, particularly *chronic bronchitis*, *bronchorrhœa*, *chronic pleuritis*, and *tubercular phthisis*. In these cases, the infiltration commences either in the face or in the lower extremities, only occasionally extends as high as the thighs or hips, and seldom becomes general; but is often associated with effusion into the cavities of the chest. Organic changes of the *liver* and *uterine* organs but rarely occasion anasarca, until after effusion into the cavity of the peritoneum. The observations already offered respecting the connection of dropsy with *disease of the blood-vessels and lymphatics* (§ 27.) are entirely applicable to this species of the disease. Although complete obliteration of one even of the largest venous trunks has taken place, serous effusion will not necessarily follow, especially if a collateral circulation be established. A remarkable instance of this is recorded by Mr. WILSON, where the *vena cava* was entirely obstructed, but no vestige of serous effusion existed,—evidently proving that other pathological conditions, beside venous obstruction, are requisite to the occurrence of effusion; whilst in the case of obliterated *cava* published by LAENNEC, ascites and anasarca

of the lower limbs existed. Of the agency of disease of the vascular systems in causing local or partial anasarca, sufficient notice has been taken (§ 25. *et seq.*). The *causes*, *morbid appearances*, and *prognosis*, in anasarca, have been described under these heads in the early part of this article (§ 8. 14. 37.).

132. iii. TREATMENT.—1st. *Of partial or local Anasarca*.—After removing the remote cause (§ 8.), the next object that we have to attain, is to restore the natural secretions and excretions, when any of these are in fault, and to remove the pathological state on which the affection depends. The restoration of the secretions will be attempted by the means appropriate to the chiefly disordered,—by purgatives, diuretics, diaphoretics, deobstruents, &c., as the intestinal, the renal, the perspiratory, and the biliary secretions, may indicate more or less of disorder or of interruption. If the œdema depend upon the *arthritic* or *rheumatic* diathesis, after the use of these means, colchicum internally, and iodine externally, may be prescribed, and aided by the support of bandages: if it proceed from *amenorrhœa* or the final disappearance of the catamensia, a moderate bloodletting, general or local, should precede the means directed to act on the secretions. In many of such cases, as well as in others where there is no obstruction to the excretion, particularly in females who have no children, or who are subject to constipation, or to fecal accumulations in the large bowels, the *femoral veins* are either chronically inflamed, obstructed, or varicose. Their course should therefore, be carefully examined; and if hardness or tenderness exist, leeches ought to be applied. In old or chronic cases, however, the veins will either feel hard and obstructed without much pain, or they will be nearly obliterated, the superficial vessels being distended and varicose, and the surface of the limb sometimes purplish or dotted with dark red spots, cold, tumid, and unyielding to the touch; pain and stiffness being referred chiefly to the lower part of the leg and ancle. In several such cases, I have prescribed, with marked benefit, deobstruent purgatives, the biborate of soda, and iodine, causing the patient to wear a laced stocking, and to have frequent recourse to frictions. Benefit will be derived also from frictions with mercurial liniments, united to one of those above to be referred to; and from a course of bitter aperient medicines. When the disease of the veins is connected with marked debility or weak powers of digestion and assimilation, general tonics, chalybeates, frictions with stimulants, and deobstruent liniments (§ 65.), will accelerate a cure. (See PHLEGMASIA DOLENS and VARI-
—Diseases of.)

133. The connection of œdema with *amenorrhœa*, independently of obstruction in the veins, requires a persevering internal use of iodine, or the biborate of soda, with tonic aperients, or the compound decoction of aloes, &c., preceded by general or local depletion when signs of plethora or internal congestion are present. It is when there are chlorotic appearances of countenance and surface, or irregular menstruations of hysteria, with great mobility of the vascular, and susceptibility of the nervous system, a weak, soft, open, or undulating pulse, and

No. 421., et cent. i. obs. 21. (*Consequent on measles.*)—*J. Spon*, Aphorismi Novi Hippocr. 1689. p. 392. (*Bloodletting.*)—*Bonet*, Méd. Septentrion. i. iii. sect. 21. p. 723.; et *Polyalthes*, l. iv. cap. 46. 59. (*Antiphlogistics.*)—*Col de Villars*, Ergo Leucophlegmatiz Leves Scarificationes. Paris, 1738.—*Guenault*, Ergo Leucophl. Leves Scarif. Paris, 1750.—*Adet*, Ergo Leucophlegmatiz Leves Scarificationes. Paris, 1758.—*Cartheuser*, De Leucophlegmatia. Fr. 1760.—*Livingston*, Edin. Med. and Phys. Essays, vol. ii. p. 407.—*Pleuciz*, Act. et Observ. Méd. p. 87. 107.—*Stoll*, Rat. Med. par. iii. p. 302.—*Alir*, Obs. Chirurg. fasc. i.—*Sauvages*, Nos. Méth. vol. ii. p. 470.—*Thilenius*, Med. u. Chirurg. Bemerk. p. 168.—*Cheston*, Philos. Transac. 1780, p. 323. 578. (*Thoracic duct obliterated.*)—*Bang*, in Act. Reg. Méd. Soc. Haun. vol. iii. p. 118.—*Aaskow*, in Ibid. vol. iii. art. 15.—*Hartmann*, De Anasarca, Lac Sulph. et Acid. Sulph. &c. Fr. 1787.—*Dore*, in Edin. Med. Comment. vol. xviii. p. 135.—*Tozzetti*, Raccolta, &c. No. 4. (*Recommends blisters in the anasarca consequent on scarlatina.*)—*Tode*, Med. Chir. Biblioth. b. v. p. 432.—*J. P. Frank*, De Cur. Hom. Morbis, l. iii. p. 75.—*Chalmers*, On the Dis. of South Carolina, vol. ii. p. 20.—*Vicussens*, in Journ. de Méd. Contin. t. iii. p. 3.—*Leib*, in Philad. Transac. vol. i. p. 1.—*Marcus*, Magazin für Specielle Therapie, b. ii. p. 342.—*Melitsch*, in Stark's Archiv. b. iii. p. 724.—*Beauchêne*, in Journ. Génér. de Méd. t. xxxii. p. 371.—*Windmann*, in Hufeland u. Himly's Journ. d. Pr. Heilk. Oct. 1809.—*Sackenreuter*, in Allgem. Med. Ann. März 1811, p. 243.—*Dessessart*, Recueil de Dissert. et Observ. de Méd. Prat. Paris, 1811.—*J. Wilson*, in Trans. of Soc. for Imp. of Med. and Chir. Knowledge, vol. iii. p. 65.—*W. C. Wells*, in Ibid. p. 167. et 187.—*D. C. F. Harles*, De Hydr. Inflammatorio, in Opera Minora, vol. i. p. 339.—*Gairdner*, Ed. Med. and Surg. Journ. vol. xiv. p. 479.—*Steele*, in Ibid. vol. xvi. p. 545.—*Landré-Beauvais*, Dict. de Méd. t. ii. p. 192.—*Laennec*, Archiv. Génér. de Méd. t. vi. p. 619.—*Koenig*, in Hufeland's Journ. July, 1829.; and Archiv. Génér. de Méd. t. xxi. p. 449.—*Venables*, in Lond. Med. Gazette, vol. v. p. 397.—*Beatty*, in Trans. of Assoc. Phys. of Ireland, vol. iv. p. 23.—*J. Bouillaud*, in Dict. de Méd. et Chir. Prat. t. ii. p. 320. (*See also the BIBLIOGRAPHY AND REFERENCES to Dropsies in Genere.*)

VII. DROPSY OF THE CAVITIES OF THE CHEST.

143. DEFIN.—Sense of oppression in the chest; urgent dyspnœa on exercise or in the horizontal posture; livid lips: œdematous countenance and extremities; weak, small, and irregular pulse; disturbed sleep, with sudden startings, &c.

144. As dropsy of the pericardium is so very generally connected with more or less effusion into the cavities of the pleuræ, that we seldom find the one without the other, although in varying grades and relative proportions; and as the former, as well as the latter, is a very frequent consequence of structural change in the substance of the lungs, or in the pleuræ, or in the heart itself and its valves; I shall, therefore, describe them as species of the same genus. The difficulty, also, of determining whether the fluid is chiefly, or altogether, in the pericardium, or in the pleuræ, even in cases where it is limited to one only, is an additional reason for considering hydro-pericardium and hydrothorax in connection with each other. It is principally, however, when the effusion is symptomatic of structural lesions of the thoracic viscera, or of a more generally morbid state of the frame, that we find them co-existent, and without any remarkable preponderance in favour of either the one or the other. But when effusion is the more immediate result, or the sequela, of inflammatory action, or of a state of organic action, closely allied to inflammation in either the pericardium or pleuræ, it is generally limited accordingly, and it often accumulates to a very great extent.

i. DROPSY OF THE PERICARDIUM.—SYN. *Hydrops Pericardii*, *Hydro-pericardii*, *Hydro-pericardia*, *Hydro-pericardium* (from *ὕδωρ*, water, and *περικάρδιον*, pericardium) of Authors; *Hertzbeutelwassersucht*, Germ.; *Hydro-péricarde*, Fr. *Dropsy of the Heart*, Eng.

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145. DEFIN.—Oppressive dyspnœa, with a sense of weight and tremor referred to the region of the heart; anxiety; inability to retain the supine posture; weak, irregular, or intermitting pulse; livid and œdematous countenance; distension of the jugular veins; leipothymia; fulness of the epigastrium, and of the anterior intercostal spaces; percussion emitting a dull sound, and auscultation furnishing a faint and diffused sound, over all the cardiac region.

146. A. It is obvious that pathologists ought to agree as to the least quantity of fluid in the pericardium that should be considered to constitute dropsy of its cavity. *Vesalius* states, that it always contains a small quantity of water in health, and that he had observed it in criminals who had been quartered while alive. *Lower* entertains a similar opinion. *F. Hoffmann*, however, comes to a different conclusion; he having observed no fluid in the pericardium of healthy animals; whilst *Littre* found some in the animals on which he experimented. *Haller* believes that this cavity contains a fluid destined to facilitate the functions of the heart, but gives no opinion as to its quantity, in health. He remarks, that it may be greatly increased in various diseases, and that it may be absorbed, (*Elementa Physiol. &c.* 4to. vol. i. p. 292.). *Senac* infers that, in the natural state, the pericardium contains no fluid; he having found none in several cases in which this membrane and the heart were both healthy. *Corvisart*, *Testa*, *J. P. Frank*, *Kreysig*, *Bertin*, *Louis*, *Elliotson*, *Hope*, &c., appear to have adopted the opinion of *Haller*, in considering that this cavity always contains a little fluid; but they differ in some respects as to the amount which should be viewed as constituting dropsy of it. *M. Corvisart* believes that, when it reaches six or seven ounces, hydro-pericardium exists. This inference has been adopted by *Pinel*, *Bertin*, *Elliotson*, and *Hope*, who think that this quantity will give rise to symptoms indicating, although with great uncertainty, the seat of effusion; whilst *Laennec* concludes that double or triple this quantity may not admit of a correct diagnosis. Much, however, will depend upon the rapidity of its collection, and the nature of the pathological states either causing it, or connected with it. A larger quantity than that now named, has sometimes accumulated without having induced such symptoms as could enable the practitioner to decide as to the exact nature and seat of the disease, particularly when chronic affections of the lungs or heart have accompanied it.

147. From one to five or six ounces of fluid are sometimes found in the pericardium, in several maladies either of adjoining or of remote organs, especially in persons who have died of phthisis. This collection, obviously greater—at least, the higher amount—than exists in health, seldom gives rise to specific symptoms, although the larger quantity may occasion much disorder. It may, indeed, form very shortly before death, and may merely be contingent on the changes immediately preceding dissolution, particularly when the malady destroys life by asphyxia, or when congestion of the lungs and disorder of the respiratory actions have been present for a short time previously; and its amount may even be increased subsequently to the fatal issue. When fluid collects

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action of the air upon the inflamed or otherwise diseased membrane; and hence the impropriety (and probable cause of failure in several cases) of leaving a canula in the opening, or of introducing a tent sponge. I state this from having seen this practice adopted in cases of paracentesis, and carefully observed the antecedent and consequent states of diseased action. I would, therefore, submit, when the last resource of an operation is attempted, that it should be performed with the utmost precautions against the introduction of the external air; and that the opening should be carefully and accurately closed, and kept closed, instantly upon the discharge of the fluid; and that, instead of preserving an opening for its continued flow, the operation should be repeated when it becomes really necessary. (See HEART and PERICARDIUM.)

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ii. DROPSY OF THE PLEURAL CAVITIES. — SYN. *Hydrothorax* (ὕδωρ, water; θώραξ, the chest), *Hydrops Saccorum Pleuræ*, Auct. var.; *Dropsy of the Pleuræ*; *Hydropisie de la Poitrine*, Fr.; *Brustwassersucht*, Germ.; *Idropisia di Petto*, Ital.; *Water in the Chest*.

158. DEFIN. — *Dyspnœa* and oppression in the chest, increased by the horizontal posture and exercise, with œdema commencing in the eyelids and ankles; startings from sleep; the sounds on percussion being dull, and the respiratory murmur not heard on auscultation.

159. *Hydrothorax* has been divided into *idiopathic* or *primary*, and *symptomatic*. It is very rarely primary, as M. LAENNEC has observed — that is, without pre-existing disease of the pleuræ, lungs, heart, or large vessels. But it is often *consecutive* of increased vascular action, or inflammatory irritation of the pleuræ, without any

lesion of other parts, particularly when it follows the eruptive fevers; and it may be a termination of pleuritis, especially in the lymphatic or phlegmatic temperament, and in the cachectic habit of body. Its *symptomatic* or *complicated* states are the most common. As the *consecutive hydrothorax*, in all its forms, is generally acute or sub-acute, or possesses more or less of the sthenic characters, it will be considered as such; whilst the *symptomatic* will be viewed as a passive, chronic, or asthenic disease.

160. A. ACUTE AND SUB-ACUTE HYDROTHORAX; *Inflammatory Hydrothorax*, *Hydro-pleuritis*, or *Hydro-pleurisy*, of RAYER. — That this form of pleural dropsy consists of increased exhalation from the pleuræ, depending upon increased vascular action and determination to this surface, will be admitted; but that it is identical with inflammation, of an acute and healthy kind, may be questioned. The symptoms, local and constitutional, in hydrothorax of the most acute kind, and in pleuritis — either the pulmonary or costal — are certainly not identical, particularly in respect of severity. Hence, although much similarity exists, as far as mere vascular injection, or determination of the circulation, is concerned; and although pleurisy may terminate in, or give rise to, serous effusion in many instances; yet the kind of organic action affecting the pleuræ, and the attendant constitutional disturbance, are not the same in both. The difference has already been alluded to (§ 18.); but I may here add, that the formative processes — the kind and grade of organic vascular action — characterising pleuritis, are not observed either in the local lesions or in the constitutional affection of acute hydrothorax, unless when the effusion supervenes on external injuries and inflammation, or is an earlier attendant on a modified condition of such disease. The consecutive states of acute pleural dropsy, as it may be studied after scarlatina, either during life, or in the morbid appearances, illustrate this view, and prove that there is, as respects both the conditions of the effused fluid, and the changes in the pleuræ, a difference in the kind of organic action whence they have proceeded, from true inflammation, and that such difference is evidently connected with constitutional causes. It is very common to observe that, when an attack or attacks of either pneumonia or pleuritis have been removed by treatment, a slight exposure to their exciting causes, or irregularities on the part of the patient, before the diseased vessels have regained their healthy tone and action, will give rise to a less acute, or a smothering, state of disease, either attended by, or quickly terminating in, effusion; the reduced powers of the constitution, the lost tone of the exhaling pores, and the general or local excited action, favouring this particular malady — this morbidly increased serous exhalation — in preference to any other. In this way acute or sub-acute hydrothorax supervenes on a state of the frame which has not recovered from previous disease — more particularly from eruptive fevers — or which has been impaired by age, excesses, or irregularities; the powers of life, and the organic action thereon depending, being insufficient to develop sthenic or phlogistic inflammation. The *inferences*, then, from the causes, accession, phenomena, and con-

comitant changes observed in the *acute* or *sub-acute* disease, are, that it is not identical with healthy inflammation, although frequently so nearly allied to it as to appear either as a termination, or as a lower grade, or as a modification of it; and that it is often connected with, even although it may not be dependent upon, the nature of the preceding malady, in which the secretions and excretions have been interrupted, and not sufficiently restored.

161. That inflammation of the bronchi, or of the substance of the lungs, will sometimes be propagated to the pleuræ, generally in consequence of constitutional fault or injudicious management, and give rise to effusion into their cavities, is well known; that inflammation of the surface of the liver, or of the peritoneum, or of both, will occasionally extend to the pleuræ, particularly in debilitated or cachectic subjects, and, having reached this situation, terminate in effusion, I have often remarked; and that the state of vascular action, whose similitude or connection with true inflammation has been noticed, but whose identity with it has been denied, will occur in the pleuræ in various states of sequence and of complication, has been a matter of daily observation, and may be readily illustrated from the pages of BONET, MORGAGNI, STOLL, LEPOIS, LIEUTAUD, LEROUX, and many other of the writers referred to. In some localities, also, and during certain epidemics, it has been remarked that peripneumony has evinced a remarkable tendency to terminate in this manner. Dr. ROMERO states, that on the coast of Andalusia, hydrothorax and hydro-pericardium are endemic, owing chiefly to the prevalence of hot and humid winds, and sudden atmospheric vicissitudes, particularly among those who are ill fed, or live on unwholesome food, and are given to intoxication or irregularities; and M. PARISSET observed this form of hydrothorax prevalent in Geneva, in 1803,—the symptoms being so light that the patient's appetite and ability of attending to his affairs continued until the pleural collection induced violent oppression. He states, that the number who died among the French conscripts was very considerable,—the effused fluid being limpid and inodorous, and the pleura greyish and thickened, and the lung compressed, or condensed.

162. The *morbid appearances* in the acute form of hydrothorax, whether it has been connected with inflammation, or active congestion of the substance of the lungs; or has proceeded from a modified form of pleuritis, either occurring primarily, or consecutively on an eruptive fever, or after the suppression of some chronic disease of the skin, or of an accustomed discharge; are usually the following:—The *fluid* presents every shade of colour already remarked (§ 11.)—is sometimes turbid, muddy, reddish, sanguineous, whey-like, or sero-purulent; but more frequently transparent, of a citron tint, with filaments or numerous albuminous flocculi floating in it. The *membrane* is internally reddened, or injected, thickened and somewhat softened, and occasionally covered by an albuminous, granulated, or tuberculous exudation. The *lungs* are generally compressed, condensed, hepatized, or tuberculated; and present appearances of chronic inflammation. The *causes* of this form of hydrothorax are the same as those described above (§ 8, 9, 19.).

163. B. SYMPTOMATIC, PASSIVE, OR COMPLICATED HYDROTHORAX.—This state of disease is dependent upon some obstacle to the circulation of the blood, or lymph. Its connection with dilatation of the cavities; with hypertrophy, atrophy, &c. of the substance, and with alterations of the valves, &c. of the heart; has been long since pointed out by BONET, MORGAGNI, LIEUTAUD, MEAD, SANDIFORT, &c. Disproportion between the capacities of the cavities, ossification of the valves, and various other lesions of this organ, have been still more minutely examined in relation to the production of hydrothorax, by CORVISART, LAFFITTE, TESTA, KREYSIG, BERTIN, and others. Varicose dilatation, also, of the veins of the lungs, and compression or obliteration of them, from chronic pneumonia, or tubercular and other productions, are sometimes the immediate causes of effusion. The dependence of this form of the disease upon alterations of the lymphatics, either in their glands or in their trunks, once so strongly insisted upon by the able pathologists already named in connection with this doctrine (§ 27.), although not improbable, has not been established so as to admit it otherwise than as an occasional, and by no means frequent, occurrence.

164. The *fluid* effused in this form of hydrothorax is commonly transparent, colourless, or of a citron tint; in rarer cases, it is of a light brown, or reddish hue, or even sanguineous; its quantity varying from a few ounces to ten or twelve pounds, in both the cavities. In some cases, a quantity of aeriform fluid is also present. (See art. PLEURA.). On the evacuation of the serum, the pleuræ are generally observed to be sound, or merely paler, or somewhat softer, than natural. When the accumulation has been great, the lungs are generally pushed up to the vertebral column, are hardly crepitous, and are occasionally pale as if macerated; but they sometimes admit of being distended by insufflation, when they have not been inflamed and hepatized. In this form of the disease, effusion frequently takes place into the pericardium, as a coexistent result of the same organic changes; and occasionally some fluid is also found in the abdomen, or even within the head; but more commonly in the cellular tissue, constituting a more or less complicated or general state of dropsy. M. RAVI justly remarks, that anasarca, hydro-pericardium, and ascites, are more frequently associated with hydrothorax when it is caused by organic lesions of the heart, than when it is consequent upon alterations of the lungs.

165. C. DIAGNOSIS.—As hydrothorax is generally produced by anterior disease, it follows, that it will not become manifest until some days, or even some weeks or months, afterwards; or, in cases of organic change of the heart or lungs, not until a few days or weeks previously to death. Even with the aid of percussion and auscultation, small collections of fluid are ascertained with much difficulty, and are marked by the symptoms of the lesions that cause them. But when the accumulation is considerable, it is generally evinced by phenomena which are proper to it. The patient feels an oppression and difficulty of breathing, great in proportion to its quantity. He generally lies upon the affected side, leaving the healthy lung unincumbered in its functions. When the fluid is in both cavities, the respiration is still more

or never resorted to, excepting in empyema. In some states of the acute disease, especially when the effusion is principally in one cavity, and is not attended by organic changes in the lungs or heart, of a necessarily fatal or dangerous kind, the condition of the patient in other respects not contra-indicating the propriety of performing it, this operation may be as safely and beneficially practised on the thorax as on the abdomen; the same risks — and no greater — existing in respect of the one as of the other. It has been recommended by GOULA, DUVERNEY, BIANCHI, DELAPORTE, MORELAND, HUETTER, MORAND, LULLIER, J. P. FRANK, MURSIMA, BELL, ROMERO, and ARCHER, and practised successfully by nearly all of them. The chief danger proceeds from the introduction and action of the air; but not so much from its preventing the dilatation of the lungs, as from its action on the diseased pleura, and the fluid effused from it, as shown above (§ 157.). (See arts. LUNGS, and PLEURA.)

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VIII. DROPSY, CONGENITAL (*Hydrops Congenitus*; Dropsy of the Fetus and new-born Infant.).

174. DEFIN. — Effusion of watery fluid in the serous cavities, or cellular tissue, generally con-

sequent upon disease of the mother, or upon organic change in the appendages, or in some of the viscera, of the fetus, or upon both causes.

175. Congenital effusions of fluid are found — (a) in the ventricles, or between the membranes of the encephalon; (b) between the membranes of or in the spinal cord; (c) within both the head and the spinal canal, in the same case; (d) in the abdominal cavity; (e) in the subcutaneous and other parts of the cellular tissue; (f) in the cavities of the chest — the pericardiac and pleural; and, generally, in the above sequence, as respects frequency of occurrence. They are observed in the fetus at the full term of utero-gestation, and in abortions chiefly during the middle and latter months; and are, with the associated diseases either of the uterus or of the appendages of the fetus, the cause of its death, or of its premature expulsion.

176. i. CONGENITAL HYDROCEPHALUS (*Hydroceph. congenitus*) sometimes appears, as other forms of congenital dropsy, dependent upon disease of the uterus, or on constitutional taint in the parent or parents, or upon organic change in the placenta or umbilical chord. In rare instances it has been associated with ascites in the mother, or with dropsy of the amnion; but it more frequently occurs without any such connection. In these latter cases, it may be imputed to a morbid action seated in, and more strictly limited to, the membranes, or internal cavities of the brain. It is often attended by an arrest of the formation of the encephalon at some stage of the process; but, in other cases, the brain is fully, if not more than usually, developed. When the fluid effused, either in the general cavity of the arachnoid, or in the ventricles, is considerable in amount, the ossification of the cranial bones is interrupted generally towards their sutures, but occasionally in other parts; and, in these situations, the membranes are often protruded to a greater or less extent, forming, with the scalp, a watery tumour (*hydrencephalocèle*), which may be large at birth, or scarcely perceptible, and may subsequently disappear altogether, or become larger. When the effusion is chiefly in the ventricles, the distended cerebral substance, and the membranes, with more or less of the fluid, constitute the tumour; unless the effusion has taken place previously to, and thereby prevented, the development of the cerebral substance and hemispheres. Hence the character of the rupture depends upon the situation of the fluid; and its form, upon the size of the aperture through which it presses. Some forms of the disease approach to hemicephaly; a large portion of the cranium being wanting, and the protruding brain being covered by a thin membrane. In other cases, the opening is small, narrow, or cleft-like, and the protrusion is either small, or has a narrow neck; the fluid being, in such cases, usually effused between the membranes. These ruptures are most frequent in the back of the head, in different parts of the occipital bone, and in the lambdoidal suture; and less frequently in the top, sides, and front of the cranium. (See the Cases, and Writers referred to.)

177. Congenital hydrocephalus arises at various epochs of foetal existence. At the earliest periods, it interferes more or less with, or entirely arrests, the formation of the brain, and cranial

tained large dropsical cysts, and even in the same cyst with the watery collection: the cyst in which the hair and fatty substance had been formed having subsequently become the seat of dropsical effusion.

202. *B. CAUSES.* — (a) The *predisposing causes* are, the scrofulous diathesis; debility, however induced; frequent or excessive menstruation, and venereal indulgences. The disease occasionally commences as early as the first appearance of puberty. J. P. FRANK saw it at thirteen, and M. ITARD at fourteen years of age. MARJOLIN states, that it may begin before puberty; but I know of no such occurrence. It is most common between the ages of twenty and fifty. It may commence soon after the cessation of the catamenia; but, although chronic cases of it are found in very old females, yet it rarely originates at an age much beyond fifty. It often follows abortions.

203 (b) The *exciting causes* have not been satisfactorily shown: but it has been very generally imputed to external injuries, succussions of the pelvis, the mismanagement of parturition and abortions; or to cold, fright, and anxiety of mind. From much attention to this disease, I have inferred that it is occasionally consequent upon inflammatory action in the ovaria or uterus, or connected with this change in its earlier stages. Hence its causes may be considered to be, in some cases, those in which inflammatory action in these organs generally originates. Yet there are numerous objections to this view; for even when the tenderness and pain in the region of the ovaria, accompanying its commencement, are greatest, there is also a frequently recurring and copious menstruation, indicating an excited, rather than an inflamed, state of these organs. From various considerations, and a review of the circumstances in which the disease seemed to originate, it is not improbable that it is connected with an often excited, but an imperfectly gratified, sexual appetite. Hence its frequency in females who are sterile, or whose state of health is insufficient to the developement of a healthy and vigorous orgasm, owing either to premature and illicit indulgences, or to previous disease.

204. *C. SYMPTOMS AND PROGRESS.* — Ovarian dropsy is very commonly far advanced before recourse is had to medicine. It usually commences with irregularity of the menstrual discharge, and disorder of the excretion of urine, which is either voided frequently, or is long retained. There is also severe pain in the loins, with pain, tenderness, and swelling in one or both iliac regions. In some instances, the pain shoots through the abdomen, and down the thighs; and occasionally there is numbness, hæmorrhoids, or complete strangury, owing to the pressure of the enlarged ovary before it rises out of the pelvis. The catamenia, at this period, is frequently either copious or of too frequent occurrence; but it is rarely altogether suppressed. Various hysterical symptoms also come on; and disappear at a later stage. The bowels are usually costive; but they are sometimes irregular, or relaxed. As the malady proceeds, the patient experiences various dyspeptic symptoms, and often nausea and vomiting, as in the early months of pregnancy. The mammae also enlarge, and the areolæ around the nipples assume a darker shade. Dr. SEYMOUR

states, that, when both ovaria are affected, the catamenia are always absent; but, when one only is diseased, this evacuation is either absent or irregular. This does not agree with my experience, the results of which I have just now given, as regards the early stages of the disease; but, as respects the last stages, particularly in the more chronic cases, the observations of this physician seem to be correct. With the increase of the tumour, various inflammatory phenomena, referrible chiefly to the peritoneum, and commencing in the pelvis, but often extending upwards to parts of the abdomen, supervene.

205. The *progress* of the tumour and abdominal enlargement is extremely various. Occasionally the ovary, whether it consist of a number of cysts, or of one or few, increases very slowly. It sometimes remains long stationary; afterwards augments rapidly, and fills, ultimately, the whole abdomen; and in rarer instances it recedes, or even entirely disappears. It proceeds more regularly, however, in most cases, until it gives rise to appearances rendering the diagnosis very difficult. The general health, as already stated in respect of encysted dropsies, continues but little impaired, until the morbid accumulation has advanced so far as to disturb the functions of adjoining viscera; but this is not uniformly the case; for the means used to cure it not infrequently are sources of disorder, deranging the natural functions, and thereby favouring the increase of the disease. When the collection rises as high as the epigastric region, and the abdominal distension is great, the functions of the stomach are often completely overturned, and the constitutional powers rapidly sink: singular and unexpected changes, however, sometimes occur, even in the most chronic cases. Dr. BAILLIE mentions an instance of its spontaneous disappearance, after it had existed thirty years; the patient remaining, subsequently, in good health. The accumulated fluid is also occasionally discharged into some part of the large intestines, having previously formed adhesions with it; or into the vagina, pressure on the tumour increasing the discharge. Instances of this have occurred to Dr. ELLIOTSON, Dr. MONTGOMERY, myself, and others. In a case treated by me some years ago, and put upon a course of iodine, the catamenia were profuse every fortnight or three weeks. The tumour, which filled the whole abdomen, remained long stationary, and ultimately burst into the large intestines. It did not return again until upwards of a twelvemonth: ultimately the patient was so much benefited as to leave off treatment. Dr. SEYMOUR adduces an instance, in which the morbid collection was discharged both by the intestines and by the vagina, and recovery took place. Sometimes it forms adhesions to the abdominal parietes, and bursts externally at the umbilicus. A permanent cure is often effected by judicious management under the foregoing circumstances. A case was seen by me, in which adhesion of the tumour took place, to the parts adjoining the puncture by which its contents had been drawn off. The cicatrix ulcerated, and the fluid was afterwards discharged by degrees through the opening, and the patient recovered. A nearly similar instance of recovery occurred in the practice of Mr. BARNWELL. When the fluid finds its way into the peritoneal cavity, the result

used externally. In this case it should be rubbed upon the insides of the thighs; where, if it should produce irritation of the integuments, the effect will be the more salutary.

209. *Cathartics* and *diuretics* have no influence upon the disease, further than to accelerate its progress, if they be used in such a manner as to weaken the powers of life. Purgatives of a tonic kind, however, may be employed to evacuate fecal matters, and to promote the intestinal secretions; but such only, as are not calculated to excite or irritate the large bowels, should be selected; as the bitartrate of potash with confection of senna, or the infusion of calumba or of gentian with infusion of senna. As to *diuretics*, I have seen no benefit derived from them, with the exception of those which possess tonic and astringent properties, as the balsams and terebinthines; the latter of which have been productive of benefit, particularly when used in the form of liniment or epitheum. Camphor and narcotics are also useful palliatives, especially opiates. The *liquor potasse*, and BRANDISH'S *alkaline solution*, in suitable vehicles, and aided by sarsaparilla, by local depletions when tenderness in the situation of the tumour is perceived, and by setons, have also been of great service in some cases in which I have prescribed them. The good effects of vomiting in swelled or inflamed testicle have induced some practitioners to have recourse to *emetics* in the early stage of this malady. Dr. PERCIVAL records a case in which they proved of service; but I have had no experience of the practice. Mr. ABERNETHY prevented the reaccumulation of the fluid after tapping, by repeated blistering. Dr. HAMILTON (*On Mercurial Medicines*, &c. p. 202.) states that he has cured seven cases by percussion, or patting, for a long time daily, on the tumour, using a bandage so as to make constant compression, giving a solution of the muriate of lime, and employing the warm bath. Many instances will, however, be found to confirm the opinion of Dr. W. HUNTER (*Med. Observ. and Inquiries*, vol. ii. p. 41.) "that the patient will have the best chance of living longest under it, who does the least to get rid of it." In addition to the above means, but little can be attempted with much hopes of success. The chief objects are to support the vital energies throughout the frame,—to promote a healthy assimilation, and the excretion of effete matters,—to ward off all irritation, physical and moral, from the uterine organs,—to adopt a light, cool, and moderately nourishing diet,—to engage the mind agreeably,—to reside in a dry, airy, moderately warm, or temperate locality,—to take regular but gentle exercise in the open air,—and to have frequent change of scene and atmosphere.

210. *Paracentesis* in some instances becomes operative, owing to the urgency of the symptoms, particularly after it has been once performed; and the extirpation of the tumour has been recommended by VANDER HAAR, DELAPORTE, MORAND, OGGER, SIEBOLD; and practised by L'AUMONIER, SMITH, LIZARS, BLUNDELL, GRANVILLE, M'DOWALL, and DIEFFENBACH. Of these measures a brief notice is required.—(a) The observations which have been already offered on *paracentesis* apply to the treatment of ovarian dropsy even more fully than to any other. It often accelerates a fatal issue inducing inflammation of the sac. Of this I

saw a remarkable instance many years ago in a near relative. Dr. J. Johnson has adduced an example of it (*Medico-Chirurgical Review*, vol. xi. p. 258.). Dr. MACINTOSH refers to one in his practice (*Practice of Physic*, vol. ii. p. 374.); and many others have been recorded, and observed by experienced practitioners. I therefore agree with Dr. DENMAN, that paracentesis ought to be deferred as long as possible. In such circumstances, this operation occasionally gives temporary relief; but there is a frequently recurring necessity for its repetition until the patient sinks. It has been proposed to effect a radical cure by evacuating the matter, and either laying open the tumour, or keeping a canula inserted in the wound. LE DRAN mentions two cases which recovered from great suffering consequent on this measure; and analogous examples have been recorded by HOUSTON, VOISON, and PORTAL. But these are few compared with the numerous instances in which it has either failed, or accelerated a fatal issue by the severe inflammation and constitutional disturbance thereby induced. In two cases in which I was consulted, a canula had been left in the puncture, and rapidly produced these effects; the introduction of air and the mechanical irritation having inflamed the cyst and peritoneum, and converted the secretion to a foul, foetid, and ichorous discharge: both rapidly proved fatal. It has likewise been proposed to inject the cyst. Dr. DENMAN mentions a case in which this was practised, but the patient died on the sixth day afterwards.

211. The *extirpation* of the tumour, although entertained by the older surgeons, was discountenanced by MORGAGNI, DE HAEN, SABATIER, and MURAT. L'AUMONIER, of Rouen, however, performed this operation successfully towards the close of the last century; and it has recently been practised by Dr. SMITH and Dr. MACDOWALL, of the United States, with a like result. Notwithstanding the favourable issue of these cases, I stated, in the *Medical Repository*, at the time of their publication, reasons against resorting to this measure. The issue of several cases in which it has since been performed, both in this and other countries, confirms the opinion I then expressed. The operation has no chance of succeeding unless it be resorted to during that stage, at which a judicious constitutional treatment may either delay, or even remove the disease: and I believe that the cases in which it has succeeded are such as would have terminated favourably if they had been left to nature or to medical management. The results of the cases in which it was performed by Mr. LIZARS and Dr. BLUNDELL, are well known; and I may add that it has likewise been attempted at least five times at Berlin, by DIEFFENBACH, CHRYSMER, and MARTINI (*GRAEFE and WALTHER'S Journ.* b. xii. h. i.), and, excepting in one instance, it entirely failed. Three of the patients died in consequence of the operation. In one case the surgeon did not proceed in the operation, on finding the tumour adherent on all sides.

212. ii. DROPSY OF THE FALLOPIAN TUBE—*Hydrops tubalis*—is not to be distinguished from ovarian dropsy; nor, indeed, does it differ from it further than that, instead of the cyst being in the ovary itself, it is developed in the fold of the ligament, near the uterus, or close to the ovarium, or to the fimbriated extremities of the tube; these extremities being either adherent to the ovarium, or

226. **LIT. HIST.**—Acute hydrocephalus, notwithstanding the remark of Hippocrates already referred to, was formerly confounded with cerebral fever, or fever with determination to the brain. A case, in which it is accurately described, but considered as one of fever merely, was published by Dr. St. CLAIR, in 1733, in the *Edin. Med. Essays and Observations*, vol. ii. p. 287. Mr. J. PAISLEY of Glasgow, in the following year (in *Ibid.* vol. iii. p. 333.), recorded a case, with the *post mortem* examination, and first recognised it as a specific form of disease. It was not, however, until the appearance, in 1768, of Dr. WHYTT's "*Observations on the Dropsy of the Brain*," that the history of the malady and its nature were made subjects of investigation. The observations of Dr. FOTHERGILL (*Med. Observ. and Inquir.* vol. iv.) contributed something to the knowledge of its symptoms; but those of Dr. WARREN, in the same work, furnished evidence merely of its extreme danger. Dr. DONSON's case, published in 1775 (*Ibid.* vol. vi.), was valuable, inasmuch as it showed the possibility—at the time, very generally doubted—of curing the disease; and of the influence of mercury in bringing about this result. HARRIS, however, had long before stated, as Dr. CHEYNE has remarked, that a physician of experience had saved children in fevers attended by unusual stupor, and even coma, by giving them *mercurius dulcis* six times sublimed.

227. The opinion of WHYTT, that the disease depends upon laxity of the exhalants, or upon a watery state of the blood, had been generally received, until Dr. QUIN, in 1779, maintained that it is allied to inflammation,—a doctrine which had suggested itself both to Dr. WITHERING and Dr. RUSH, before Dr. QUIN's views had become known. Dr. WITHERING stated explicitly, that the malady originates in inflammation; and that the water found in the ventricles of the brain is not its cause, but its consequence. Dr. RUSH made an important addition to its history, by showing that it may be produced by other diseases, especially by fevers, rheumatism, pulmonary consumption, the exanthemata, and worms; and that death may supervene, preceded by hydrocephalic symptoms, and little or no water be found in the ventricles,—circumstances which will be fully enquired into in the sequel. Dr. PERCIVAL demonstrated its frequent connection with scrofula, and seemed impressed with the idea that it is not altogether identical with inflammation in its nature. Its inflammatory origin was afterwards supported by Dr. PATTERSON and Dr. GARNETT, although neither appeared to consider it advisable to carry the depletory and antiphlogistic treatment so far as such a doctrine might have warranted. This last writer believed that in hydrocephalus, a local inflammation without much general sthenic diathesis obtains; and that a depletory treatment, injudiciously employed, may weaken the general tone of the system, and increase the effusion, without materially diminishing the local morbid action, for the removal of which such means are employed. Of the justice of this view there can be no doubt. The local action, which has been called inflammatory, merely because it is attended by injection of blood-vessels, has been too generally treated as true inflammation occurring in a

healthy constitution, and without reference either to the series of vessels affected, or to the grade or the product of action; and, what is equally important, without regard also to the diathesis, or state of vital manifestation and power. It is unnecessary to notice here the opinions of more recent writers, as the chief of them are referred to in their proper places.

228. **DESCRIPTIVE HISTORY.**—The *Precursory* or *Early Symptoms* of acute hydrocephalus are remarkably diversified, owing to the circumstance of their dependence upon disorder of the digestive organs, or of the circulation in the brain and membranes; and it is chiefly owing to the predominance of the symptoms referrible to one or other of these parts that the disease has been divided by some writers into the primary or idiopathic, and the secondary or symptomatic. The possibility, however, of making the distinction in practice, is not so easy as some writers would make it appear. For the dependence of the functions of the liver, and digestive organs, upon the state of circulation in the encephalon, and of the latter on the former, is so very intimate, that it is often impossible to ascertain which is primarily affected. The majority of writers on the disease in this country, consider that the digestive organs are the first to betray disorder; whilst the French pathologists and Dr. ABERCROMBIE believe that the morbid action very frequently commences either primarily or simultaneously in the brain itself. I am convinced, that the true acute hydrocephalus originates more frequently in the encephalon, than the abdominal functions indicate, and at a period anterior to the disorder which these functions manifest,—such disorder often proceeding from the silent morbid action in the brain, reacting on it, and promoting the evolution of those changes constituting the disease; and that, when hydrocephalic symptoms supervene more suddenly and violently, and without much previous disorder of the chylopoietic viscera, or nervous system, they have a more intimate relation to acute or sub-acute inflammation of the brain and its membranes, than to those states of morbid action which terminate in copious effusion, and to which the term hydrocephalus is more strictly applicable. The chief exceptions to these inferences will be found in those who inherit a peculiar morbid diathesis or predisposition to the malady—who are scrofulous or weakly constituted,—and in these the brain and its membranes will often coetaneously suffer, in a greater or less degree, with one or more of the digestive organs; the excited action it experiences being either attended, or soon followed, by deficient power, and by relaxation of the exhaling surfaces. In these cases, as well as in those in which it is ushered in, or predisposed to, by derangements of the abdominal viscera, it does not, as in true cephalitis, readily occur in a previously healthy constitution, but chiefly in states of pre-existing ailment, or as a consequence of inflammatory action arising under such circumstances,—in which not only the chylopoietic viscera imperfectly perform their functions, but also the organic nervous system is weak, and the capillary vessels and exhalants are so deficient in tone as to be readily relaxed or exhausted when over-excited. In other words, that acute hydrocephalus is a consequence of

procured with difficulty, this change depending chiefly upon the morbid condition of the secretions poured into the digestive canal: the urine is scanty and turbid, and has often a milky appearance (ODIER, COINET, and VIEUSSEUX). The erect posture or motion, particularly rotating the head, brings on sickness and retchings, without the appearance of offensive matters. There are also great fretfulness and restlessness; contracted pupils; frowning, or knitting of the brows; inability to sit up; a whining or moaning noise when lying down; and sometimes a slight cough, with irregular suspirious breathing. The sleep is short and restless; the infant rolls its head on the pillow, or often awakens with a scream or crying, and raises its hands to its head. The nostrils and lips are dry and cracked. This period is very variable in duration, but it usually continues from ten to fifteen days.

232. (b) *Second stage.*—The pulse, from being very quick, excitable, irregular, and weak, now becomes slower—sometimes as slow as natural, or even more so; but chiefly when the patient is in the horizontal position; for if he attempt to sit up, it generally acquires its former frequency. The sensibility is now remarkably impaired: sopor or stupor gradually supervenes, with dilated pupils, squinting, and imperfect or double vision. The eyes are dull, heavy, vacant or staring; the eyelids drooping or half closed. Sickness or retchings are now less frequent, unless the child be raised up, when one or both often occur. The excretions are passed unconsciously, and are scanty, and procured with difficulty. The stupor is interrupted by exclamations, or shrill piercing screams; the hands, which are tremulous, being raised to the head or neck, or occupied in picking the lips or nostrils. Emaciation proceeds rapidly; but food is generally swallowed greedily when presented. These symptoms are, however, by no means uniform; for the pupil is frequently, particularly at first, oscillatory, or, although dilated, affected by light. The stupor, also, is not always constant; nor does the pulse always become slow. Deep inspirations, hectic flushings of the cheeks, catchings of the muscles, cold extremities, low delirium, and an almost total suppression of urine, are occasionally observed. The duration of this period varies from four or five days to two weeks.

233. (c) *The third stage* has been generally recognised by the returning frequency of pulse, which is often remarkably rapid, thready, and weak; by the occurrence of general or partial convulsions; by paralysis of one side or limb; by twitching of one or more of the muscles; and by suffusion of the eyes, the eyelids being motionless, and the cornea becoming dim and filmy. Often, when one side is paralysed, the other is more or less convulsed. The patient is now either insensible or delirious. He rolls his head on the pillow, grinds his teeth, moves the unparalysed hand in the air, and moans or breathes heavily and hurriedly. Alternate flushings and pallor, or flushes of one cheek, the other being pale; irregular distribution of the circulation; partial sweats; cold extremities; irregular, or stertorous breathing; an eruption of vesicles about the mouth, or on the face and upper part of the chest (FORMEY, GÖRLIS, SCHMALZ, RAIMANN, and myself); collapse of the countenance; blueness

or paleness of the lips; and more rarely, sphacelating sores; are remarked towards the close of the disease. The dilatation of the pupil and strabismus generally continue throughout this stage, which may terminate fatally (generally in a violent convulsion) in a few hours, or it may last for ten or twelve days or even longer. Such is the common course of the most frequent form of the disease, which comprises the *Nervous* and *Gastric* of BRACHET; and which may either originate in the encephalon, or in the digestive organs. But it is seldom that the early history of the case is so precise as to enable the physician to draw a correct inference as to its commencement. In some instances, I have observed slight symptoms of cerebral disease, for some weeks, or even months, after repeated attacks of congestion or of inflammatory action within the head, of a well marked character, but supposed to have been removed by treatment. In some of these cases, the disorder of the digestive organs was so evident as to give rise to the idea of the primary affection of these viscera, indicating the difficulty of ascertaining the parts first deranged. The information furnished, in most instances, seldom enables us to carry our pathological analysis sufficiently far back to connect the early ailments with their causes; and, consequently, we often fail in ascertaining the quarter where disease commences.

234. B. *The Inflammatory variety*, or the second form of Dr. CHEYNE, of M. COINET, and of HOPFENGÄRTNER, is more acute than the preceding. The *precursory* symptoms are generally of short duration, and sometimes so slight as to be overlooked. This variety nearly resembles fever, with predominant affection of the head; and in many cases it is not to be distinguished from inflammation of the brain and its membranes (see BRAIN, § 174. *et seq.*), the disease being merely a modification of inflammatory action, depending upon diathesis, and previous state of health; and, owing to these circumstances, giving rise to effusion. After the child has been drooping for a short time, fever, with slight, short, and irregular remissions, flushings, severe headaches, increased heat and sometimes soreness of the scalp, augmented sensibility, thirst, hot skin, brilliancy of the eyes, and tenderness over the abdomen, supervene; the pulse being rapid, hard, or small; and the tongue white or loaded. Stupor or unwillingness to be roused, alternating with violent screams, and complaints of the head and belly; great irritability of the stomach; retching readily brought on by changes of position or by sitting up; a morbid and scanty state of the alvine evacuations; a vacant, dejected, or heavy expression of the eyes; a pained and terrified look; occasional cramps of the extremities; and diminution of all the secretions and excretions; commonly characterise this form of the malady. This *first stage* is usually accompanied with many of the phenomena of the first period of the foregoing variety: the chief difference being in the more febrile condition of that now under consideration, in the earlier and more evident connection of the symptoms with the brain, and in the shorter continuance of this stage. As soon as the changes which attend the *second period*, *viz.* dilated pupils, strabismus, stupor, diminished frequency of pulse, &c. appear, the progress of this is in all respects the same as that of the first variety; the stages being

to grapple with the obvious malady, until we know more of its antecedent pathological states. If we adopt the views of M. ROSTAN, no changes, excepting those immediately consequent upon remote causes, will be considered essential.

258. Several writers, observing the history and lesions of hydrocephalus to differ in several respects from inflammation, yet still to resemble it very closely, have viewed it as a peculiar form of inflammatory action affecting the more interior surfaces and substance of the brain. Thus, CONRADT termed it *Encephalitis exudatoria infantilis*; BRACHET, *Hydrocéphalite*, or watery inflammation of the brain; and COINDET, *Céphalite interne hydrocéphalite*. Other writers, particularly ABERNETHY, CURRY, CHEYNE, YEATS, THOMPSON, &c., have considered it as most commonly proceeding from disease in the digestive organs, and seldom arising from primary inflammatory action in the brain or its membranes. This opinion has been carried too far, for I have often had evidence to convince me, that morbid action had been proceeding in the brain long before it was suspected, and that one of its chief effects was to disorder the liver and digestive canal; this sympathetic disorder being frequently considered as primary, and its reaction on the brain as the sympathetic production of hydrocephalus. I believe that the malady often originates in the substance of the brain; and that, conformably with what is observed in respect of lesions of this structure, the digestive viscera, frequently at one time the most remarkably deranged, are merely sympathetically affected. FORMEY and Dr. SHEARMAN have viewed the effusion as a consequence of simple excitement of the cerebral circulation entirely independent of inflammation. The latter writer has considered it to be contingent on various diseases, and to arise from a diversity of causes; but that its occurrence is chiefly owing to the predisposition or previous state of the membranes,—the essential character of the disease consisting in that previous state or predisposition which, in connection with an excited state of the circulation, gives rise to increased exhalation or effusion. Dr. C. SMYTH has argued against inflammation, and in favour of debility as the cause of the effusion; but whilst he has strenuously contended for the latter pathological condition as respects the tone of the extreme vessels, he has admitted the existence of accelerated circulation, and its influence in producing the disease. There is one inference, however, in which nearly all modern pathologists agree, viz., that the effusion itself does not constitute the malady, but is only its consequence,—contributing to the production of the more advanced symptoms, but in a less degree than many suppose.

259. *Pathological Inferences.*—(a) The first or nervous form of acute hydrocephalus is frequently consequent upon changes in the substance of the brain, in the membranes lining the ventricles, and in the vessels and circulation of the encephalon, probably arising from the state of the organic nervous influence supplied to this quarter, and to the perversion of the vital actions. (See DISEASE, § 87—92.)—(b) That these changes often commence gradually, or almost imperceptibly, and proceed far before they disorder the functions, either of organic or of animal life, in a remarkable degree; and when such disorder becomes manifest,

it is often difficult to trace the quarter in which it has originated, owing to the intimate dependence of both classes of functions upon the organic nervous system.—(c) That the changes observed at dissection in this variety have evidently been in progress a considerable time before effusion has taken place; the effusion being the consequence of these changes, assisted by the physical condition of the encephalon.—(d) That nervous, as well as inflammatory and consecutive, hydrocephalus being merely contingent upon lesions of the organic nervous influence of the circulation, and of the substance and membranes of the brain, such lesions actually constitute the disease during its early periods.—(e) That the nature of the cerebral affection, and the exact state of vascular action, in these periods, are not manifest; but it is not to be at all inflammatory—which admits of dispute—the vascular action possesses more of an asthenic or ataxic, than of a sthenic, character, or is attended by a perverted, rather than by a dynamic, state of vital power; and by imperfect performance of the digestive and assimilating functions.—(f) That, although the first form of the disease be consecutive of changes in the circulation, or in the organic nervous influence of the brain, the resulting phenomena may be so mistaken for the exciting causes, that the organs of locomotion may be so enfeebled as to occasion falls, which will aggravate the primary affection, and develop a state of sub-inflammation, or of vascular reaction in the encephalon, and its usual consequences, viz. determination of blood, injection of vessels, and effusion of serous fluid; or the viscera of digestion and sanguification may become so congested, or otherwise disordered, as to appear the parts primarily affected.—(g) That when this form is coincident with, or consecutive of, congestion, inflammation, or other disorders of the digestive and chylopoietic viscera, effusion into the ventricles cannot be viewed as the earliest changes that take place within the head; but that this effusion is merely consequent upon similar changes to those which have been already alluded to (d, e); the lesions in the digestive organs, as well as the earlier alterations in the brain, being, very probably, coexistent with, or of pre-existing disorder of the system, or of constitutional vice.—(h) In whatever quarter the disorder commences, it is probable that, sometimes at least, the sensorial power becomes exhausted, possibly coextensively with the supervention of the second stage, and the cerebral tissue more or less wasted; but it is difficult to say whether this wasting be the consequence, or the cause, of the effusion into the ventricles.—(i) That, in the early stage of the disease, as well as in its progress, the vascular excitement, or febrile disturbance, attending it is characterised by general adynamia or perversion of vital power.—(k) That great cerebral excitement does not necessarily imply the existence of inflammatory action in the encephalon; for accelerated circulation in a weakened state of the frame, and susceptible condition of the sensorial and nervous system generally, will produce cerebral excitement, particularly towards the close of febrile or protracted diseases; but this, instead of being inflammation, is a state very different from, or sometimes even opposed to, it, as shown by the *lædencia* and *jactatio*, as

menced. When the disease has been detected sufficiently early, and when it has followed previous attacks of congestion or inflammatory action in the head, the febrile excitement being neither general, continued, nor well marked, the application of blisters behind the ears, and of leeches around, or close to, the blisters, has been of much service. But it will be requisite to repeat this practice every second or third day, or oftener, and to carry it as far as the circumstances of the case may warrant. If the cerebral affection appear to have been induced by disease of the digestive and chylopoietic viscera, a blister should be placed on the epigastrium or right hypochondrium, and leeches applied around it, as soon as redness is caused by it; when it ought to be removed. This method may be repeated, according to circumstances, after intervals of one, two, or three days: it possesses great advantages in this state of the disease, inasmuch as, whilst it relieves the gastric symptoms and the affection of the liver, it is a most energetic derivative from the head, without reducing vital power so far as general depletion does; for general bleeding, however early employed in this variety, is seldom productive of much benefit. Indeed, I have seen it detrimental in many instances; and I consider both it, and local depletion, if carried to any considerable extent, as decidedly injurious in some states of this form, particularly in weak and cachectic children.

268. *B. Cathartics.*—The discharge of morbid secretions and faecal collections should be procured as early as possible by remedies calculated, at the same time, to derive from the brain, and to diminish vascular plethora and excitement. The fulfilment of this intention is appropriate to all the states of the disease. A large dose of calomel, either alone or with James's powder, ought to be immediately exhibited, and, after three hours, repeated with the addition of toasted jalap, or scammony; and its operation should be promoted by an active terebinthinate enema. If the irritability of stomach be such as to prevent the retention of medicine taken by the mouth, vascular depletion, a blister or mustard cataplasm on the epigastrium, and an active cathartic enema, will often remove it. Calomel, in full doses, will generally be retained, under any circumstances; but, in conjunction with cathartics, it is frequently ejected, unless after the measures now stated. *Elatarium*, in small and repeated doses, has been suggested by Dr. ELLIOTSON; but it, as well as *croton oil*, will seldom be kept on the stomach. When retained, they are occasionally of use. I have seen most advantage derived from the latter, when it has been added to the terebinthinate enema, or applied over the abdomen as a rubefacient. Dr. CHEYNE found a drachm or two of magnesia saturated with lemon-juice, given every two or three hours, most useful in such circumstances; and I believe that this will act more certainly than irritating purgatives, particularly if a full dose of calomel have been taken a few hours previously. A gruel or broth enema containing some purgative salt may also be administered two or three times in the course of the day; and if the bowels be very torpid, and the sopor considerable, the terebinthinate enema should be repeated daily, or even oftener. Saline purgatives may also be given in

the infusion of senna, when they can be retained. Active catharsis at the commencement of the disease, after vascular depletion has been instituted to an extent which the nature of the case demands, will have a more decided effect than any other means whatever.

269. *C. Cold applications* to the head, the hair having been removed from it, should be employed in the manner, and with the precautions, directed in the article BRAIN, § 192., whenever the temperature of the head will admit of them. But, like the measures already advised, it is only early in the disease, and in the inflammatory states more especially, that they are productive of much benefit. In these states they may be used simultaneously with the tepid semicupium or pediluvia, salt and mustard having been added to the water. RUSH, QUIN, CONRAD, FORMEY, GOELIS, and nearly all the writers on the disease, are favourable to cold applications in its treatment; and, in some form or other, they are appropriate to most of its states.

270. *D. Mercurials.*—These are, perhaps, the next important means that can be employed. They have been very generally prescribed since they were first adopted by DOBSON and HAYGARTH, and subsequently by EASON, MACKIE, REEVE, LETTSOM, HOOPER, HOFFENGÄRTNER, FERRIAR, and more recent writers. Early in the first stage of the disease, *calomel*, given every three or four hours, in full doses, either alone or with James's powder, in small quantities, is, in ordinary circumstances, the best preparation. In children under one or two years, neither salivation, nor much intestinal disorder, will be produced by it. In those above three or four years, its specific action may be obtained, but with little certainty, even although it be conjoined with opium or the compound ipecacuanha powder. When no essential benefit has accrued from the foregoing means, and the bowels have been fully purged as directed above (§ 268.), then calomel may be given with digitalis and narcotics, or with the latter only, particularly opium or hyoscyamus, with the view of fulfilling the third and fifth intentions of cure (§ 263.). But in young children, especially when the bowels are griped, or are irritable, the *hydrarg. cum creta*, with small doses of compound ipecacuanha powder (E. 653.), will be most serviceable. The bowels, however, should always be kept sufficiently free by either of the enemata recommended (§ 268.). I may add, that calomel has been prescribed with cantharides, by DOBSON; with James's powder, by CAMPBELL; with opium, by LEIB and others; with digitalis, after local depletions, by WEAVER, GOELIS, and FISCHER; with digitalis and arnica, by J. P. FRANK; and with active purgatives (in which form I believe that it is most generally beneficial), by HUFELAND, CHEYNE, ABERCROMBIE, and many others. Dr. MERRIMAN and myself have given very small doses of the *bichloride* of mercury, every four or five hours, with advantage. In the second stage, this is one of the best preparations that can be prescribed; but it requires much caution; and, in this period of the first and third forms of the disease, it should be prescribed in tonic and diuretic infusions. The utmost care should be taken in exhibiting mercurials in these forms, particularly in cachectic subjects, and where the powers of life are much

tured the head at the upper third of the lambdoidal suture. The wound continued to discharge fluid for several days, and it afterwards perfectly recovered from the disease. In the same work, for April and November, 1830, the operation of puncture is stated to have been successfully performed in St. Bartholomew's Hospital. *GRAZIE* (his Journ. for 1831, b. xv. p. 3.) punctured the head of an infant hydrocephalic from birth, in the fourth month, and repeated the operation about eleven times during six months. The fluid was allowed to escape slowly each time; the canula being removed, and the wound closed, as soon as the pulse became weak. After the last puncture, the sutures closed. The child could walk and speak when a year old. At the age of two years and a half, it was shown to the Medico-Chirurgical Society of Berlin. *MR. RUSSEL* (*Edin. Med. and Surg. Journ.* July, 1832, p. 43.) operated on a girl eight months old, hydrocephalic from birth, and whose head was twenty-three inches in circumference, when he first punctured it. The operation was repeated four times, after intervals of about ten days; but the quantity of fluid withdrawn each time was small. After the last puncture, calomel was given so as to affect the mouth; when the hydrocephalic symptoms disappeared, and ossification of the sutures proceeded. The case is stated to have been cured. *DR. CONQUEST* is reported, in a contemporary work, to have operated in nine cases, — successfully in four of them. The greatest number of punctures in one case were five, and the intervals between them from two to six weeks. The largest total quantity of water removed was fifty-seven ounces, by five operations; and the largest quantity at one time, twenty ounces. The trocar was introduced through the coronal suture, below the anterior fontanelle, and the wound carefully closed after each evacuation. Pressure was made by means of strips of adhesive plaster.

310. The cases in which I have been concerned in directing the operation, have all been unfavourable to its success. Medical treatment had been actively and perseveringly employed in all of them; and it is therefore probable, that such of them as admitted of recovery were amongst the number that was cured. Whilst in those in which the operation was resorted to, and which were mostly congenital, either the state of the brain and its envelopes precluded recovery, or the circumstances in which out-door patients of public charities are placed were such as to render this operation less successful than it otherwise might have been.

311. *γ.* Having stated the evidence we at present possess of the success of the operation, inferences as to the propriety of performing it may be easily drawn. Those who argue against it contend — (*a*) that it is apt to induce an irritative state of inflammation in the substance or membranes of the brain, particularly in the weakened and otherwise predisposed systems of such subjects — 1st, by the mechanical injury done to those structures; and 2dly, by the entrance of air through the puncture; — (*b*) that the collapse consequent upon the removal of the fluid is injurious to the organ and system; — (*c*) that the operation cannot change the state of the organ or function giving rise to accumulation; and hence that it cannot be permanently successful; — and (*d*) that the in-

stances of success from it are not so numerous as those from medical treatment.

312. Those in favour of the operation, on the other hand, argue — (*a*) that greater injury than that by the puncture is often done to the brain and membranes, without bad consequences; — (*b*) that the air may be prevented from entering by the aperture; — (*c*) that danger from collapse is readily obviated; — (*d*) that cures from medical treatment, in an advanced stage, and when the head has become greatly enlarged, are very rare, and are then most likely to be obtained by an operation; — (*e*) that the instances of success on record are sufficient to warrant its performance.

313. *δ.* From much experience, I conclude that inflammatory irritation of the brain and its membranes does follow the operation in some instances; that the state of these parts, and of the system, favours its occurrence; and that the encephalic structures are in a very different condition in this disease, both mechanically and vitally, — but especially as to proneness to inflammatory action, and softening, — from what they are in health. — (*a*) Whilst, therefore, I so far agree with those who argue for the operation, as to advise it to be tried after the measures I have detailed above have failed, yet I would not recommend its performance early in the disease — 1st, because medical treatment has then sometimes effected a cure, especially when the head has not been very greatly enlarged; and, 2dly, because, when the fluid is in the ventricles, as it generally is in cases commencing after birth, a greater depth of brain must be penetrated to reach it at an early, than at a later, period. — (*b*) When punctures are resorted to, medical treatment must not be abandoned, or even relaxed: for we should still endeavour, according to the principles explained above, to remove the disposition to effusion, as well as to promote absorption; and, as a certain degree of pressure is requisite to the healthy performance of the cerebral functions, strips of plaster, as are already directed (§ 306.), should be applied around and over the whole scalp, in order to prevent the collapse consequent upon the operation. — (*c*) I believe that the punctures ought not to be frequent, nor much fluid withdrawn at one time; that gentle pressure should be made around the cranium during the discharge; that the discharge ought to be stopped, and the puncture accurately closed, so as to prevent the entrance of air, as soon as the pulse begins to sink; and that restoratives should be exhibited, in order to prevent convulsions, or other nervous symptoms. — (*d*) The operation seems to be best performed by a small trocar, or grooved needle; but it is difficult to withdraw any fluid with the latter, as the surrounding pressure fills up the groove. The application of a cupping glass may, however, procure a discharge. A thin trocar, with a two-edged or lancet-shaped extremity, — not a thick triangular pointed instrument, — is preferable, upon the whole.

314. *d.* *Urgent symptoms*, especially convulsions and inflammatory action, require to be palliated or removed. — *a.* *Convulsions* should be treated according to the manner described in that article, particularly by the terebinthinated medicines and enemata already prescribed (§ 299.); by these, conjoined with the syrup of white poppies, or this latter with the oxide of zinc; by

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DRUNKENNESS — INTOXICATION. — SYN.
Temulentia, Pliny, Plater, &c. *Paraphrosyne temulenta*, Sauvages. *Ebrietas*, Lat. *Ivresse*, Fr. *Trunkenheit*, Rausch, Germ. *Ebbro*, Ital. *Ebriety*, *Inebriation*.

CLASSIF. III. CLASS. I. ORDER (Author.)
 1. **DEFIN.**—*Mental excitement, followed by stu- por or coma, from the excessive use of fermented or distilled liquors.*

2. The frequent occurrence of intoxication, either casually or as a confirmed habit, would justify the notice I am about to take of it, even independently of its influence in causing and modifying disease. But it is chiefly to the more complete states of intoxication, and especially those demanding medical care, that attention will

be here directed. Drunkenness, in its various phases — from the daily indulgence in more vinous or spirituous fluids than is required, but short of affecting the nervous system in a very evident manner, up to that degree of excess by which the senses and intellects become obscured or entirely lost — predisposes to many diseases, and directly causes others. Slighter excesses in the use of fermented liquors — particularly wine and malt liquors — occasion plethora, with all the consequent ills, especially gout, apoplexy, paralysis, and congestion of the abdominal vis- cera. Greater excesses, and the too free use of spirits, exhaust nervous and vital power, in- ducing tremors, nervousness, delirium tremens, encephalitis, paralysis, and insanity; occasion affections of the digestive organs, particularly anorexia and dyspepsia, diarrhoea and dysentery, inflammation, and structural changes of the biliary organs; and produce disorders of the urinary and sexual functions, even sterility and impotency; and, ultimately, lesions of the kidneys, and dropsies.

3. Drunkenness is not a vice of recent date, although it may have become more common with the progress and diffusion of luxury. We find it mentioned in the early history of the Jews; and *TACITUS* informs us that it was prevalent amongst the ancient Germans. It is tolerably evident, from the ancient lyric and dramatic poets and satirists, that it was by no means infrequent amongst the higher classes in Greece and Rome. *HIPPOCRATES* notices its worst states, both in his *Aphorisms* and in his *Prognostics*; and it does not appear to have been considered a very culpable sort of indulgence even by some of the sages of antiquity. *PLATO* cautions against allowing wine to youths at an earlier age than eighteen years, and against be- coming intoxicated before forty; but, after this age, he considered some degree of indulgence in this way pardonable. This was possibly, also, the opinion of *SOCRATES*.

“Hoc quoque virtutem quondam certamine, magnum
 Socratem palmam promeruisse ferunt.”
 CORN. GALL. Eleg. i. ver. 49.

And *HORACE* states, that *CATO* the Censor often warmed his virtues by wine.

“Narratur et prius Catonis
 Sæpe mero caluisse virtus.”

It is evident that the vice increased amongst the ancients with the diffusion of luxury; until, at last, even the ladies occasionally followed the example so generally set them. *VALERIUS MAXIMUS* (l. ii. cap. i.) states, that in the earlier periods of Roman history, the women seldom drank; and *SENECA* (*Epist.* 95.) remarks, that at a later period, they indulged so freely in this way, that they became nearly as subject to the diseases occasioned by the practice as the men. Erroneous opinions as to the effects of intoxication upon the frame seem to have been very early entertained, and were generally prevalent in the fifteenth and sixteenth centuries. *MONTAIGNE* mentions, that the celebrated *SYLVIVS* informed him that an occasional debauch was beneficial, inasmuch as it roused the energies of the stomach; an opinion long entertained by medical men, but zealously combated by *MM. HONNETS* and *LANGLOIS*. There can be no doubt, however, that, as expressed by the late *Dr. GREGORY*, an occasional excess is, upon the whole, less injurious

are said to have used common salt for this purpose; and the Romans surrounded their heads by wreaths, formed of various refreshing plants. Nothing further, however, may be said on this topic, than that intoxication, and perhaps various consecutive ill effects, will not so readily be produced when wine is taken upon a very large meal; but if this become a habit, it will very speedily induce gout or apoplexy. Cold applications, or cold sponging the head, will also delay or prevent intoxication, unless excess be carried to a worse than beastly length.

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DUODENUM — ITS DISEASES.

1. That the duodenum performs an important part in various diseases, and that it is itself the chief seat of serious ailments, which are with great difficulty, or not at all, distinguishable from disorders of the stomach, pancreas, gall-ducts, liver, or right arch of the colon, cannot be doubted. Some writers, especially Dr. YEATS, BROUSSAIS, and his followers, suppose that affections of this viscus may be ascertained by attentive observation. They may in some cases; but with no degree of certainty; for, after the most diligent investigation of a train of phenomena apparently emanating from this organ, the inferences we shall arrive at will often possess only a certain degree of probability; for the same, or very similar symptoms, may proceed from the other viscera now named. It must, however, be admitted, that serious disorder of the duodenum will seldom exist without the functions of these organs being more or less disordered, as well as those of the stomach and small intestines; and ultimately organic change may be propagated to a greater or less extent from this viscus to one or more of them. It becomes, therefore, a matter of great importance to be acquainted with the symptoms occasioned by the more common pathological conditions of the duodenum, although we are at the same time convinced that these symptoms may be produced by changes in some one or more of the immediately adjoining organs. With all this uncertainty, however, the experienced observer will often come to just conclusions as to the seat and nature of the disease, founded on his knowledge of the functions and morbid relations of this and the surrounding parts. The duodenum is liable to all the functional and organic changes described in the article DIGESTIVE CANAL, but in different relative degrees of frequency.

I. FUNCTIONAL DISORDER OF THE DUODENUM.

CLASSIF. — I. CLASS, I. ORDER (*Author*).

2. i. PATHOLOGY. — (a) It is extremely probable that impaired function of this viscus gives rise to various symptoms of indigestion; warranting the designation of *duodenal dyspepsia*, if they could be distinguished from those proceeding from the stomach. But, granting that they can, we have no proof that the duodenum is the sole, or the chief seat of disorder, even in those cases which seem to admit of the least degree of doubt of such being the case. For, owing to the intimate structural connection — by continuity of tissues, blood-vessels and nerves — even functional disorder cannot exist to any sensible amount in it without being extended to the stomach, intestines, pancreas, and biliary organs. *Asthenia*, or deficient vital action of the duodenum, may be inferred in cases characterised by an unimpaired, irregular, or ravenous appetite; by constipation, and a deficient secretion and excretion of bile, the stools being light-coloured, greyish, or foetid; by a loaded sedimentous urine; by a feeling of languor and drowsiness, with fulness at the right epigastrium, and oppression and sense of distension towards the right hypochondrium, or right shoulder-blade, or loin, two or three hours after a full meal; occasionally by head-ache or vertigo; or by pain, or a burning sensation in the soles of the feet; by absence of fever, and a pale or foul lurid appearance of the cutaneous surface. But, in this state of disorder, the collatitious parts are coetaneously, and some of them even co-ordinately, affected. In attempting a fine series of pathological analysis, let us not be carried away either by flights of imagination or by efforts at mathematical precision, and attribute to a single organ what proceeds from several. But let us merely endeavour to interpret the phenomena of nature aright, according as they actually exist, and not as we suppose, or would have them to be. (See INDIGESTION.)

3. (b) Accumulations of *sordes*, the presence of acid and acrid matters, of worms, or of morbid bile, may very probably take place in the duodenum as a consequence of indigestion, or atony of the stomach, or of torpor of the liver, or even of the preceding affection; may irritate more or less its mucous surface; and, from its nervous and other structural connections, disorder the functions of digestion, chylification, assimilation, and fœcation; but the *ensemble* of symptoms that result can seldom be distinguished from those proceeding from disease of the stomach, pancreas, and biliary organs, owing to the reasons already assigned. These reasons will also explain the fact that irritations seated primarily in this part may be propagated, along the digestive tube, to the stomach on the one hand, and to the intestines on the other; and along the ducts, to the liver and gall-bladder on the one side, and to the pancreas on the other: and I believe further, that frequent repetitions of such irritations, occasioned either by the nature of the ingesta, or by the state of the secretions poured into it, may take place without this viscus suffering materially in structure; and yet the disorder propagated from it to its collatitious organs may terminate in structural change of them. Such results are most likely to supervene in those who partake of a highly seasoned and stimulating diet; who indulge in vinous or spirituous liquors, or take too much

or improper food. Irritation of the duodenum very probably constitutes a part of certain forms of dyspepsia; and even pyrosis, and other ailments frequently imputed to the stomach and the biliary apparatus may, with equal justice, be referred to this viscus; but it cannot be said to be the only part in fault, or even that primarily disordered; for it may be affected simultaneously with its related organs by changes primarily implicating its nerves and circulation.

4. ii. TREATMENT. — But little need be here added to what is advanced on this topic in the article INDIGESTION. It is obviously of importance to promote the functions of the duodenum by those means which are the best calculated to procure a due secretion of bile; as this fluid is essentially requisite both to the performance of those functions, and to the preservation of the tissues of the viscus in their healthy condition. But at the same time accumulations of fecal or morbid matters in the bowels should be removed. A full dose of blue pill, or of hydrargyrum cum creta, should be given at bedtime with the common purgative extracts, and in the morning any of the aperient medicines in the Appendix, particularly F. 266. 382. 872. Dr. YEATS recommends either the infusion of chamomile flowers, with the wine of aloes and liquor potassæ, or an infusion of quassia and senna with sulphate of potass, taken morning and mid-day. These, or F. 506. 547. 562. will be appropriate in most cases. But in those in which irritation is presumed to exist, I have preferred the following, which may be given daily, or on alternate days, until the evacuations become natural.

No. 196. R. Pilul. Hydrarg. gr. liij.; Pulv. Ipecacuanhæ gr. ss.—j.; Extr. Colocynth Comp.; Extr. Hyoscyami, ãã gr. ij.; Saponis Duri. gr. j. M. Fiat Pilulæ duæ horâ somni sumendæ.

No. 197. R. Sodæ carbon. gr. xij.; Extr. Taraxaci 3j.; Infus. Calumbæ et Infus. Sennæ Comp. ãã 3 ss.; Spirit. Ammon. Arom. 3 ss.; Tinct. Cardam. Comp. 3j. M. Fiat Haustus primo mane capiendus.

5. When these fail of fully evacuating the bowels, the stools still continuing unnatural, or devoid of healthy bile, it will be advantageous to exhibit a full dose of calomel at bedtime, with the extracts of colocynth and hyoscyamus, and a grain of ipecacuanha; and a draught with the compound infusions of gentian and senna, with some neutral salt in the morning. Having evacuated morbid matters, it will be requisite to give tone to the digestive organs, and to preserve a healthy secretion of bile, by prescribing two or three grains of hydrargyrum cum creta, or one or two of blue pill, at night, with extract of taraxacum, or with soap; and the infusion of calumba or any other tonic, or the decoction of sarsaparilla with taraxacum, in the course of the day. When the mercurial is relinquished, small doses of the nitro-hydrochloric acids, with the spiritus ætheris nitrici, or the chloric æther, may be taken in the infusion of cinchona. A course of Carlsbad, or of any other alterative and aperient waters, either alone or assisted by the above alterative pill, particularly when the biliary secretion continues disordered, will often be adopted with advantage.

6. As much benefit will often accrue from a well-ordered diet and regimen, as from medicine in this complaint, the patient should be careful to partake only of light food in moderate quantity, and at regular hours. He should masticate slowly and perfectly, avoid malt and spirituous liquors, and partake sparingly of wine. He ought to es-

tablish regular and habitual evacuations of the bowels, and take active exercise in the open air. Horse exercise, and the energetic employment of the muscles of the trunk and upper extremities, are preferable to walking. The shower-bath, or cold plunge bath, followed by frictions of the surface, will also prove of great service.

II. INFLAMMATION OF THE DUODENUM, AND THEIR RESULTS.

CLASSIF. — III. CLASS, I. ORDER (Author).

7. i. Inflammatory Irritation of the Duodenum.

(a) The uneasiness or sense of fulness and weight which sometimes follows a meal in the course of two, three, or four hours, occasionally with a depressed, dull pain, or feeling of distension in the right hypochondrium, and extending to the right epigastrium, and backwards to the right shoulder-blade, may depend upon chronic or sub-acute inflammatory irritation or action in the duodenum; and, if nausea or vomiting, or pain on firm pressure directed towards the situation of the intestine, accompany these symptoms, the latter state very probably exists, either as a primary affection, or as a consequence of the disorders already noticed, and of affections propagated from the stomach and adjoining organs. The above inference will be further confirmed, if the tongue be loaded or furred at its root, its edges and point being red, and the papillæ erect; if the appetite be impaired, or even sometimes ravenous; if the palms of the hands and soles be hot, and the countenance and cutaneous surface more or less unhealthy; if the bowels relaxed, griped, and the stools crude or offensive. Chronic Inflammation of the duodenum, especially affecting its mucous surface, is generally associated with disorder of the stomach, biliary organs, and intestines; and often with chronic eruptions of the skin, particularly herpes, pityriasis, and acne. The bowels are in these cases usually irritated or irregular, the evacuations offensive and otherwise disordered, very rarely natural, occasionally containing much unhealthy bile, or evincing a deficiency or obstruction of this secretion. The skin is dry or harsh. There are also frequently slight fever, sometimes with chilliness, increased thirst, a gnawing sensation at stomach, or cravings for food, and variable capricious appetite. The spirits are often dejected, and occasionally disturbed by hypochondriacal or fastidious feelings. This state of disorder is not infrequently in females, and is in them often complicated with scanty, painful, and difficult menstruation, especially in unmarried females; and with headache and various nervous complaints (See INDIGESTION — Irritative and Inflammatory States of).

8. (b) It has been supposed that cholera and bilious diarrhœa are chiefly owing to the acute inflammatory irritation of the internal surface of the duodenum by the morbid secretions poured into it; and doubtless such is the case in a great measure. But it should not be overlooked, that the organic nerves supplying the digestive tract are morbidly impressed at the same time by these secretions, and that the same agents quickly affected by their presence, the whole canal, although the impression is more directly and powerfully made upon the mucous surface and nerves of the part. In cholera, and certain kinds of poisoning, therefore, where the internal coats of the stomach are violently irritated, the consequent phenomena are not to be imputed altogether, or even chiefly

this circumstance; but in a great measure, and sometimes chiefly, to the change produced in the nerves of the organ, and propagated throughout the system to which they belong, as well as to the parts which they directly or indirectly influence.

9. ii. *Acute Inflammation of the Duodenum.* — *Duodenitis* (*Duodenite*, Fr.) may be inferred with much probability, but with no certainty; for acute disease of the liver and of the gall-ducts, or of the pancreas or of the pylorus, will give rise to very nearly the same phenomena. I believe that acute inflammation is not frequent in this viscus, or, if it be, that it does not so often give rise to disorganisation, as in other parts of the digestive canal. There can be no doubt that acute, sub-acute, and chronic inflammations are sometimes propagated to it from the stomach on the one side, and from the intestines on the other, as well as from other adjoining parts; and it would appear from cases which I have examined, and from some recorded by M. ANDRAL (*Archives Gén. de Méd.* t. vi. p. 161.; and *Clinique Médicale*, t. iv. p. 344.), that inflammation may commence in the mucous surface of the duodenum, extend along the ducts, giving rise to obstructions of their canals, either with or without jaundice, and even advance to the organs to which they belong. We more frequently, however, meet with the consequences of inflammations of these parts, in *post mortem* examinations, than with the early inflammatory appearances themselves; whilst some of the associated lesions admit of doubts being entertained whether they be the results of inflammations, or of some other state of action; but that inflammation, in one or other of its forms, often attends these alterations, cannot be denied. Thus we occasionally observe thickening and injection of the mucous and submucous coats of this viscus, with obliteration of the common ducts, and these alterations with lesions of the biliary organs, a scirrhus or enlarged state of the pancreas, or adhesions of this last with the duodenum, or of the duodenum to other adjoining parts. Scirrhus of the pylorus not infrequently extends a considerable way along this intestine; and enlargements of its mucous glands, or ulcerations, to which it is less liable than almost any part of the digestive canal, are also observed in some instances in the parts more nearly adjoining it; but we very rarely meet with a case presenting evidence of acute inflammation, and its undoubted results, upon dissection, confined altogether to the duodenum.

10. SYMPTOMS. — *a.* Duodenitis, in any of its forms, is, therefore, very seldom limited, unless at its commencement, to this viscus; and, owing to the varied connections of this part of the canal, it may implicate more than one part of very different structures and functions. It may originate in any of the functional disorders already noticed; or may directly proceed from the kind and quantity of the ingesta, whether food, drink, medicines, or poisons; or from the irritating effects of the secretions poured into it from the liver or pancreas. Admitting, with BROUSSAIS, ANDRAL, DUBREUIL, ABERCROMBIE, ROSTAN, and others, the difficulty of recognising the disease during its early existence, the existence of a dull, deep-seated, and boring pain, in a direction from the epigastrium to the right hypochondrium, right shoulder-blade, and loin, increased upon pressure made on these

regions, or upon torsion of the spine; sometimes but little felt, excepting in these circumstances, and two or three hours after a meal, when it occasionally becomes severe, and is attended or followed by sickness or vomiting; a sense of heat, or of gnawing, or of a foreign body in the region of the duodenum; great thirst; unimpaired or even a ravenous appetite; and an irregular or relaxed state of the bowels, the evacuations being copious, crude, unnatural, and offensive, are strong evidences of inflammatory action in the duodenum, especially when attended by febrile commotion of the system, similar to that already described (§ 7.), and by emaciation: but, in such cases, the immediately collatitious organs may also be diseased. Even in the more severe states of inflammation of this viscus, the pain and sickness may be very urgent a few hours after a meal, and yet but little complained of at other times, as in the rare case related by Dr. IRVING, where the duodenum only was inflamed and extensively ulcerated.

11. *b.* More frequently, acute duodenitis is consequent upon gastritis; or complicated either with it, or with a similar change in the jejunum and ilium, or with both. When it has arisen from the extension of inflammation from the inferior surface of the liver, or biliary apparatus, or when this latter proceeds from it, the stomach generally participates in the disorder, at least of function. When an irritative or inflammatory state of action extends from the inflamed duodenum to the liver, the pain rises often high in the right hypochondrium, sometimes to the right side of the thorax, especially after a meal; and is attended by bilious vomiting, occasionally with bilious stools or diarrhoea, followed by constipation, nidorous eructations, prolonged digestion, a bitter taste in the mouth, a yellow coated tongue, and a slight yellowness of the conjunctiva, and unhealthy or yellow appearance of the skin. (See JAUNDICE.)

12. *c.* The consequences of inflammatory action in the mucous surface of the duodenum are, its extension — 1st, to the stomach or small intestines, or to both; and, 2d, to the ducts, occasioning, first, obstruction or obliteration of them; and, ultimately, congestion, engorgement, enlargement, or various other lesions either of the liver or of the pancreas, or of both, with jaundice, and other contingent changes. When the inflammatory action attacks the whole thickness of the parietes of the intestine, whether originating in its mucous coat, or extended to its more exterior tunics from collatitious parts, the pancreas, pylorus, duodenum, ducts, and even the liver and colon, not infrequently become accreted or welded into one mass; in which the pancreas is often remarkably enlarged, hardened, or scirrhus, the ducts obliterated or obstructed, and the accreted serous surfaces and cellular tissue hypertrophied, or indurated, or granulated and tuberculated. A case of this description, of which I kept notes at the time, occurred in a dispensary patient, in 1820; since when, I have met with several others — two of them with Mr. PAINTER and Mr. BYAM. In three cases of this description, recorded by Dr. BRIGHT, and in one by Mr. LLOYD, fatty matters were voided in the stools; but this phenomenon either did not exist, or was overlooked in those which occurred in my practice. The instances adduced by Dr. BRIGHT presented ulceration of the duodenum, which this able

cretions, a large plaster, consisting of the ammoniac plaster with mercury, and the compound pitch plaster, in equal proportions, or of the former only, should be placed over the epigastrium and right hypochondrium, and renewed after a week. In some cases, the opium plaster may be substituted for the latter; particularly if the bowels be irritated. When there is much irritation of the nervous system accompanying the disorder of the digestive canal, much benefit will accrue from the hydrocyanic acid exhibited in demulcent or diaphoretic vehicles, as the camphor or almond mixture, or in both; and from the following, especially after morbid secretions have been evacuated by the foregoing means: —

No. 198. R. Camphoræ rasæ et subactæ gr. vj.—viij. ter. cum Magnesiæ ustæ 3j., et Sodæ carbon. (vel Potassæ carb. 3ij.); dein adde, Infus. Valerianæ (vel Aq. Menthæ Virid.) 3 viij.; Tinct. Colchici Composit. 3 ss.; Syrupi Papaveris 3 iij. M. Fiat Mist. cujus coch. ij. larga bis terve quotidie sumantur.

18. Having removed the inflammatory state, by these and other medicines appropriate to the peculiarities of the case, a similar treatment to that recommended in functional disorder of this viscus (§ 4.) may be adopted, and nearly the same diet and regimen pursued. At first, however, very light, and chiefly farinaceous, articles of diet should be taken, and the beverage should consist of small glasses of spruce beer, or Seltzer or soda water, and the bowels regulated by an aperient and tonic pill (F. 558. 561, 562.), or by lavements of warm water. As the general health improves, a more generous diet, and a small quantity of wine, may be taken; regular and active exercise in the open air being enjoyed. After the more protracted cases, or when the secretions and alvine evacuations still continue, or readily become disordered, a course of taraxacum, with minute doses of a mild mercurial, subsequently of the nitro-muriatic acids, with compound decoction of sarsaparilla; or a course of either the Harrogate, or the Marienbad, or the Carlsbad mineral waters may be tried.

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DYSENTERY. SYN.—*Dysenteria*, Gr. *Dysenteria* (from *dys*, difficulty, and *enteron*, an intestine). *Difficultas Intestinorum*; *Tormina*, Celsus. *Rheumatismus intestinorum cum Ulcere*, Cælius Aurelianus. *Fluxus Cruentus cum Tenesmo*; *Fluxus Dysentericus*; *Flumen Dysentericum*; *Tenesmus*, Auct. Var. *Dysenteris*, *Flux de Sang*, Fr. *Die Ruhr*, Germ. *Dissenterie*, Ital. *Bloody Flux*.

CLASSIF.—1 Class, 5 Order (Cullen),

3 Class, 2 Order (Good). III. CLASS, I. and II. ORDERS (Author, in Preface).

1. NOSOL. DEFIN. *Tormina*, followed by straining and scanty mucous and bloody stools, containing little or no fecal matters; and attended by febrile disturbance.

2. PATH. DEFIN.—*Inflammatory action of a sthenic or asthenic kind, seated in the mucous surface of the intestines, chiefly of the large intestines, accompanied with more or less constitutional disturbance, and retention or disorder of the natural secretions and excretions.*

3. LITT. HIST.—Dysentery, owing to its prevalence in ancient as well as in modern times, has attracted a large share of the attention of medical writers. HIPPOCRATES (*Opera*, edit. VANDER LINDEN, vol. i. p. 252., vol. ii. p. 101. 176. *et passim*) notices it in various places, both as a sporadic and as an epidemic disease; and in such a way as shows that he was acquainted with several of its pathological states and relations, and even with its complication with functional and organic disease of the liver. CÆLIUS (De Med. l. iv. cap. 15.) mentions it by the name of *tormina*, as distinct from *tenesmus*, from *lientery* (*levitas intestinorum*), and from *diarrhoea*. ARÆTÆUS (De Sig. et Caus. Morb. Diut. l. ii. cap. 9. ed. Boerhaave, p. 59.) attributed the complaint, with HIPPOCRATES, to ulceration of the intestines; and was the first to describe it in an accurate and connected manner. GALEN (De Caus. Sympt. l. iii. cap. 7.), although, perhaps, not the first to distinguish the different forms of the disease, has furnished us with the earliest attempt of this kind that we possess. He particularises a *sanguineous*, an *hepatic*, an *atrabilious*, and an *ulcerated* variety. Subsequent writers,—Greek, Latin, or Arabian,—down to the commencement of the sixteenth century, when the writings of the celebrated FERNEL first appeared, added but little to the materials scattered through the works of GALEN. From FERNEL to the present age, the disease has been nearly as well understood, as respects both its nature and treatment, as at the present time. The numerous epidemics, however, that have occurred, and been described by experienced writers, from the time of this physician, have furnished diversified facts, illustrative of its varied forms and of its treatment.

4. I. SEAT AND FORMS OF THE DISEASE.—A. The ancient writers, from HIPPOCRATES to AVICENNA, considered dysentery to be seated in the internal coats of the intestines—particularly the large intestines—and attributed it too generally to erosion and ulceration. CÆLIUS AURELIANUS, ARÆTIUS, ALEXANDER TRALLIANUS, and others, who wrote between GALEN and AVICENNA, entertained the same view as to its nature and seat, and imputed the modifications it presented to the particular part of the bowels chiefly affected. They even attempted, and not without some degree of justice, and even of accuracy, to point out, from the character of the discharges and the appearance of the blood in the stools, its seat in the small intestines, in the colon, or in the rectum. ARÆTIUS (*Tetrabibl.* iii. s. i. cap. 43.) believed that the jejunum is sometimes the part chiefly diseased, and described the symptoms—many of them really concomitants of inflammation of the mucous surface of the small intestines—that characterised this variety. Similar views were

rially in the arrangement of the acute states. ZIMMERMANN particularises the *inflammatory*, *malignant*, *putrid*, and *chronic* states. RICHTER describes the *simple*, *inflammatory*, *bilious*, and *nervous* forms; and KREYSSIG adds to these the *pituitous* or *mucous*, and the *putrid* or *malignant*. MM. FOURNIER and VAIDY adopt nearly the same division as KREYSSIG, but they adduce in addition, the association of the disease with *typhus* and *ague*. SCHMIDTMANN distinguishes the *simple*, the *inflammatory*, the *bilious*, and *bilious-inflammatory*, the *nervous*, and the *putrid* varieties. M. VIGNES, one of the most recent and experienced writers on dysentery, considers, first, its *benign* or *purely inflammatory* states, under the denomination of *mucous* and *bilious*; and, next, its *malignant* forms, comprising the *typhoid*, *adynamic*, *ataxic*, and *complicated*. In the description I am about to give of the disease, I shall follow a nearly similar arrangement to the most approved of those adopted by the ablest and most experienced of my predecessors. In the *first* place, those *acute* forms will be noticed which are the most simple, which are more or less *sthenic* or *inflammatory*, and in which the vital energies are either not materially affected, or not perverted to the extent of subduing the natural tendency of the economy to resolution and to a restoration of the healthy action. *Secondly*, the *asthenic*, or more unfavourable and complicated states, which have been variously denominated, according to the predominance of certain characters, arising out of particular circumstances and epidemic influences, will be considered. *Thirdly*, the *chronic* and *complicated* forms will be described.

II. OF ACUTE DYSENTERY.—i. ITS SIMPLE, STHENIC, OR PURELY INFLAMMATORY STATES.

CLASSIF.—III. CLASS, I. ORDER.

8. DEFIN.—*Tormina*, *tenesmus*, *mucous* or *bloody stools*, and a *sense of heat or pain in the colon and rectum*, with *tenderness on pressure*, and *symptomatic fever*; the *nervous*, *circulating*, and *muscular functions* not indicating *vital depression* until late in the disease.

9. A. CAUSES.—(a) The *predisposing causes* of the *sthenic* states of the disease are chiefly high ranges of temperature following wet and cold seasons; whatever favours the production and accumulation of morbid secretions in the biliary apparatus and *prima via*; debility of the digestive organs, particularly of the intestinal canal; a plethoric state of the vascular system; unnatural flexures of the colon favouring *fecal accumulations* in the bowels; neglect of the functions of digestion and *fecation*: the habitual use of spirituous liquors, or other inebriating beverages in excess; rich food, and highly seasoned cookery. Dysentery is generally most common in autumn and in the beginning of winter; in persons of the rheumatic diathesis; and in those who have undergone great fatigue; or who have been recently affected by continued, remittent, or intermittent fevers; but, in such circumstances, it is as often of an *asthenic* as of a *sthenic* kind.

10. (b) The *exciting causes* of the *sthenic* forms of the disease are drunkenness; exposure to vicissitudes of climate or of temperature, and especially to cold and moisture, or to the night-dews; sleeping in the open air, and more particularly on the ground, without sufficient protection intervening,

or without requisite covering, as in the case of armies in the field; wearing damp or wet clothes, or too thin clothing; acerb, acid, unripe, or over-ripe and stale fruit and vegetables; raw, cold, and indigestible fruit, &c., as cucumbers, melons, pine-apples, &c.; the stones and seeds of fruit; unwholesome food, especially unripe or blighted corn or rice; and acid or unwholesome drink, as sour or bad beer and wine. The exhalations from wet, cold, and clay soils and marshes, or from the banks of lakes, rivers, and canals; and the use of marsh, stagnant, or brackish water for drink, with many of the causes mentioned in connection with the other forms of the disease (§ 22. b.), will also produce this form in persons of a sanguineous and plethoric constitution. Mr. ANNESLEY states, that dysentery became, at one time, remarkably prevalent amongst the British troops in India to which he was attached, and that, upon investigation, he traced it to their eating the pork of the country with their breakfasts. Upon a stop being put to this practice, the disease altogether disappeared.

11. B. SYMPTOMS AND PROGRESS.—Sthenic dysentery presents various states and grades of severity, depending upon the nature of the cause, the state of the secretions, and the degree of inflammatory irritation or of spasmodic action of the bowels resulting therefrom. It is often preceded by constipation when occurring sporadically, and frequently by diarrhoea when arising from endemic or epidemic causes; but in many instances the dysenteric symptoms appear from the first, and are attended by chills or rigors. When it is caused by endemic causes, or is epidemic, the inflammatory symptoms may be very slight, and yet the constitutional disturbance and morbid action of the bowels very considerable; or the irritation and inflammation may be along the small as well as the large intestines.

12. (a) The *milder state* of the complaint, especially as it occurs sporadically in Europe, commences either with liquid and feculent or with mucous stools, the latter being occasionally streaked with blood, and always becoming so in a few days. Generally, horripilations or chills precede, accompany, or follow these evacuations, which are consequent upon gripings and a sense of increased action in the course of the colon; and are often passed with heat and scalding in the rectum, followed by straining or tenesmus. The stools are frequent; commonly from eight or ten to more than double this number in twenty-four hours, and are streaked with more or less blood. They subsequently become less mucous, more watery, and sometimes contain traces of *feculent matter*. There is little or no pain in the abdomen between the calls to stool, but often an irksome sensation is felt in the situation of the sigmoid flexure of the colon and of the rectum. The pulse is either very slightly affected, or quick and small; the tongue is generally loaded or furred; and the thirst increased. The appetite is frequently not much, or even not at all impaired. This slightest grade of the disease may terminate favourably in from six to nine days, or it may pass into a *chronic* form.—*Relapses*, and organic changes in the large bowels, sometimes also follow it.

13. (b) In its *more severe states*, dysentery is preceded either by diarrhoea, or by disorder of the stomach and bowels; or by nausea, flatulence, constipation, and occasionally vomiting. These

violent, nor the abdomen tense or tender, the rectum may be considered the chief seat of the disease; the secretions poured out in the upper parts of the intestinal canal having produced, first, irritation, and afterwards, inflammation of this part. But, if there exist much primary constitutional disturbance, this inference should not be drawn; for, in such cases, the mucous surface of both the small and the large bowels may be seriously affected, and yet these symptoms may not be present in any evident degree. Cases will also occur, characterised by tormina, twisting pains about the umbilicus, borborygmi, tension of the abdomen, more or less febrile commotion, and frequent calls to stool; the evacuations being mucous, bloody, and subsequently watery, &c.; and yet little or no tenesmus will exist. In these the seat of disease is chiefly the ilium, the cæcum, and upper part of the colon; which often become speedily ulcerated if the morbid action be not arrested. When, in addition to these symptoms, tenesmus is urgent, the rectum and sigmoid flexure of the colon are also affected.

15. In this form of disease, the quantity of matters evacuated from the bowels is extremely various. In severe or advanced cases, from twenty to thirty, or even forty, efforts at stool are sometimes made in the twenty-four hours, and often without any further discharge than a little mucous and blood; but occasionally much serous or watery matter, with broken-down fæces, slime, mucus, and blood, is voided, exhausting and emaciating the patient. In some instances, the evacuations are muco-puriform, more or less streaked with blood, without the least trace of fæces; and in others, they contain scybala. It would seem, that the retained fæces are frequently broken down or semi-dissolved by, and mixed up with, the serous and sero-sanguineous fluid exhaled from the irritated mucous surface; and hence the infrequency of scybala in many states of the disease. The evacuations are often very offensive from the commencement, but as frequently they are not manifestly so. They generally become fetid, or have a peculiar raw cadaverous odour in the last stage of the worst cases; especially when portions of the mucous surface are sloughed off. They are sometimes of a singularly variegated hue; consisting of glairy mucus, with a greenish or gelatinous substance, resembling morbid bile; seldom with pure bile; often without any trace of this secretion; occasionally with large pieces of albuminous concretions of coagulated lymph or fibrine, formed upon the internal surface of the bowel, and afterwards detached; and either with streaks of fluid blood, or with small dark coagula. When the blood is in large quantity, and is fluid and distinct from the other matters, it is evidently poured out by the lower parts of the large bowels. When consisting of dark grumous clots, intimately mixed with the discharges, it probably proceeds from the cæcum, or upper portion of the colon. It may, or may not, even when most copious, depend upon ulceration; but it most commonly is exuded from the irritated mucous surface, especially early in the disease. It may be very abundant, even at this stage, and continue so till death, particularly in drunkards; or it may be trifling throughout; or be copious only at the close of the disease.

16. The state of the abdomen also varies. In

some, tension with fulness, proceeding generally from fæcal accumulations; and flatus is much complained of from the commencement. In others, the abdomen is natural in size. Pain and tenderness on pressure are uncertain symptoms in the early stage of the disease. When it is fixed in one place, we should suspect inflammation or disorganisation to be proceeding there. It is, in the plethoric, most frequently complained of in the hypogastrium and region of the cæcum; and it may often be traced up the right side and in the course of the colon. Often there is little or no pain, nor even soreness; the patient bearing pressure without expressing any uneasiness, and yet, upon examination after death, the morbid appearances will be as extensive, in respect of the inner surface of the bowel, at least, as in those who complained of the greatest pain; the chief difference being in the more complete limitation of the lesions to the mucous surface in those cases wherein no pain was felt. It is chiefly in the last stage, when inflammatory action has extended to the serous surface of the bowels, that fulness, pain, and tenderness of the abdomen have been complained of.

17. (c) *Hyper-acute dysentery, or dysentery in Europeans removed to warm countries*, is generally occasioned by a too rich and stimulating diet, and a regimen entirely unsuited to the climate; by the too free use of ardent and intoxicating liquors; by exposure to the night air, or to cold and moisture; and by the endemic and other causes mentioned above (§§ 9, 10.). It often assumes the severe character now described; and, in persons who are plethoric, who have neglected their bowels, have lived highly, or are of a phlogistic diathesis, or who possess rigid fibres and great irritability, it puts on a still more violent or a *super-acute form*. In them, the sense of heat and soreness; the tormina, fixed pain of the hypogastrium, the tension of the the abdomen, the continual calls to stool, and the straining, are most distressing. The region of the cæcum is full and tender. The tongue is white, loaded, excited; sometimes clean and natural, but afterwards dry. The skin and pulse are frequently, at first, and for some time, very little affected; the constitutional disorder not being commensurate with the severity of the local symptoms; but the former subsequently becomes dry or hot, and the latter quick, hard, and small. In many cases, the disease begins as common diarrhoea; in others, it comes on suddenly, and rapidly reaches its acmé; and then the thirst is excessive; the urine scanty, voided with great pain, or altogether suppressed; the testes drawn up to the abdominal ring; the stools mucous, slimy, streaked with florid blood, sometimes attended by *prolapsus ani*, and rapidly passing to watery, serous, or ichorous discharges, resembling the washings of raw beef, in which float particles, or even large shreds of coagulable lymph, thrown off from the acutely inflamed surface, often with copious discharges of blood. Great depression of spirits, nausea, vomiting of bilious matters, and distressing flatulence or borborygmi, which aggravate the tormina, are also present, and, in many of the fatal cases, continue to the last. In some of these the inflammatory action extends to the sub-mucous coats, and detaches portions of the mucous tissue, which come away in the stools, in the last stage, or even hang from the rectum; any effort

preserved in tanks, and in autumn, after warm summers, in colder countries, dysentery is the most common result. The water of the Seine at Paris, from this cause, often produces the disease; and Dr. M. BARRY states, that such of the inhabitants of Cork as used the water of the river Lee, which receives the contents of the sewers, and is, moreover, brackish from the tide, are subject to a very fatal dysentery; and that, at the time to which he especially refers, at least one in three of those affected died of it. I have no doubt that the dysentery epidemic in London during several successive autumns after the great plague, was owing to the same causes, as well as to the exhalations from the burying-grounds, which received the bodies of those who died of that pestilence; and that the prevalence of the disease in besieging, as well as besieged armies, is caused by the exhalations from the decomposition of the dead; by the impure state of the water, from decomposed animal matter carried into it; by night exposure; irregular living, deficient food or clothing, and the other contingencies on encampments and operations in the field; and by crowded and ill-ventilated barracks, &c. The frequent occurrence and fatality of dysentery in fleets, in former times, evidently arose from the putrid state of the water, and the foul and stagnant air between decks, sometimes breathed by several hundred persons. During the slave trade dysentery was, and even now is, among the numerous small vessels engaged in this disgusting traffic, the chief pestilence; one half of those conveyed in these floating receptacles of misery, on some occasions, having died of it during the passage across the Atlantic. It may be here mentioned, that the dark races, particularly negroes, are more liable to dysentery than any other disease; that it assumes an extremely low or putrid form in them, when confined in ill-ventilated situations; and that, when a number, even of those in health, are shut up in such places, the cutaneous secretions, which are so abundant and offensive in these races, accumulate in and vitiate the surrounding air, so that if it be not frequently renewed, the systems of those thus circumstanced are thereby infected, and, instead of an infectious typhus, which would be the result in the European constitution, a putrid dysentery, spreading rapidly through all breathing the impure air, is developed. I had, in 1817, an opportunity of witnessing what I now state. The disease is considered by the native Africans as infectious as small-pox, and is dreaded by them equally with it; these two being the most fatal diseases to which they are liable.

24. *β.* The contagion of dysentery has been much disputed; chiefly owing to the circumstances of the different forms of the disease not having been distinguished with any degree of precision, and of the loose notions attached to the words contagion and infection, by those who espoused different sides of the question. In the article INFECTION, these terms, and their true value, are attempted to be estimated with more precision than heretofore. As respects this malady, it may be stated, as the result of observation and acquaintance with what has been written, that the sthenic forms are seldom or never infectious — and chiefly for this reason, that the circumstances in which they occur are unfavourable both to the generation of infectious emanations, and to their accumulation,

concentration, and operation, in healthy persons — that, in short, they, like all other sthenic maladies, do not evolve infectious effluvia, because the vital energies are not depressed nor perverted to such a degree, even in their advanced stages, as to give rise to the depravation of the circulating and secreted fluids requisite to the production of infectious emanations, these changes taking place only when some one or more of the causes which produce these effects — the causes of the asthenic states — come into operation; — that febrile diseases, attended by depravation of vital power and of the fluids, evolve effluvia capable, under favourable circumstances, of infecting or contaminating those disposed to be impressed by them; — and that, as the asthenic forms of dysentery are characterised by these properties, and as the emanations disengaged in their advanced stages become cognisable to the senses, as well as by their effects, it must be inferred, that these forms are infectious on occasions favourable to the action of the emanations which proceed from them. These inferences, founded on an important pathological principle, are confirmed by enlightened and most numerous observations; and, independently of such confirmation, this principle must be shown to be unfounded before the inferences drawn from it can be denied. Thus it will appear that the great difference of opinion that has existed on this subject is to be referred, first, to the fact that certain states only of the disease are infectious, and these chiefly in circumstances favourable to the development and operation of the infectious emanation; and, secondly to the incorrect notions entertained respecting contagion and infection; many believing because the disease is not propagated by mediate or immediate contact of the diseased person, or of a palpable secretion or virus, that therefore no contagion nor infection is produced by it. But the spread of dysentery very closely resembles that of scarlatina or measles, which cannot be propagated by inoculation, or by the application, either direct or indirect, of the morbid secretions to a confined part of the external surface; and yet the effluvia from the sick or the faecal evacuations, floating in a close or stagnant air, will readily induce the disease, in persons who, constitutionally, or from the influence of concurrent causes, are disposed to it, and who breathe the air thus contaminated. In such cases, the effluvia operate, as in other infectious diseases, chiefly through the medium of the respiratory organs; the system being affected, although not very manifestly, before the dysenteric symptoms are developed. Several respectable authors, however, have conceived it to be propagated, when persons repair to the water-closet or night-chair used by dysenteric patients, by the action of the infected air or effluvia upon the anus, the affection extending upwards, along the rectum. HURLAND and some others state, that they have seen the complaint communicated by the pipe of an enema apparatus. But, in most of the instances of the infectious disease that I some years ago had an opportunity of seeing, constitutional disturbance, and often diarrhoea, preceded the fully-formed dysentery.

25. *B.* FORMS AND SYMPTOMS. — *a.* The simple asthenic or adynamic dysentery. This variety is one of the most common, particularly in this country. It may occur sporadically in delicate persons,

in upon the bowels. It commonly arises, sporadically, from cold and moisture — from suppression

of the function of the skin, which is in them a much more important excreting organ than in the

34. Malignant dysentery was prevalent in Jamaica, in 1771. Dr. WRIGHT found antiseptics, especially a saturated solution of common salt in lime-juice, taken in aromatic or sweetened water, most serviceable.

35. MM. MARET, DURAND, and CAILLÉ state, that the epidemic throughout France, in the autumn of 1779, was an illustration of the aphorism of HIPPOCRATES,—"Hiems sicca et aquilonia, ver autem pluviosum et australe,"—and assumed an inflammatory, bilious, and malignant form; the second and third being very infectious. In many places, children, females, and the aged were principally affected. Blood-letting, which was repeated in some cases; laxatives, with tamarinds and manna; mucilages and emollients, in the form of drink and in clysters; camphor and anodynes, lime, and gum-water; cinchona, with camphor and the anodyne liquor, were prescribed according to the form and stage of the disease.

36. BINNSTIEL records that diarrhoea prevailed, in the spring and summer of 1780, on the Rhine; and was followed, in autumn, by a violent dysenteric epidemic of a bilious adynamic form—the symptoms being entirely the same, but more intense than I have described them. Evacuations by ipecacuanha and rhubarb, mucilages and diaphoretics, and, towards the close, cascarrilla and opium, were confided in.

37. In the years 1785 and 1786, the disease, in simply asthenic and malignant forms (§ 25. 27.), was general through the Venetian states—chiefly in females and children (CAPOVILLA). Fomentations, mucilaginous injections, emollient drinks, ipecacuanha, rhubarb, almond oil, absorbents, and, afterwards, cinchona, wine, opiates, and astringents, were most beneficial.

38. The epidemic in Champagne, especially in the French, Prussian, and Austrian armies, during the autumn of 1792, assumed inflammatory, bilious, malignant, and typhoid forms, according to the causes and circumstances in operation; and was remarkably fatal among both men and horses (CHAMSERU). Bleeding in some; ipecacuanha, antimonials, emollients, cinchona, rhubarb, tamarinds, lemonade, &c., were principally employed.

39. The dysentery that prevailed in the army of Italy (DUGENETTES) was rarely inflammatory; but very generally malignant, arising from endemic causes concurring with extreme fatigue and exposure. Aromatics, vegetable acids, and opiates; antiseptic and anodyne enemata, cinchona, and simarouba, were most frequently prescribed.

40. HUFELAND states that it was epidemic at Jena, in 1795, in the simply asthenic and malignant forms. He treated it most successfully by ipecacuanha and extract of nux vomica. It was infectious in favourable circumstances.

41. SCHMIDTMANN states that dysentery was epidemic, through the north of Germany, in 1800; and so prevalent in the town in which he resided, that very few escaped. It assumed inflammatory, bilious, nervous, and malignant forms, according to circumstances, and the constitution, &c., of those affected. Bleeding in some cases; gentle emetics in others; opium nearly in all; and camphor, decoction of bark, various astringents, tonics, and antiseptics were employed. Arnica was given in the malignant cases, but with little benefit; and tamarinds, cream of tartar, manna, or other mild purgatives, were also exhibited.

42. Dysentery, chiefly in the bilious-inflammatory passing into the adynamic form, was remarkably prevalent and fatal, at the Cape of Good Hope, in 1804 (LICHTENSTEIN); and was often associated with inflammation and structural change of the liver. This epidemic was at first very injudiciously treated by stimulants, astringents, and antispasmodics; and one in four died. The mortality was subsequently reduced one half, by means of small doses of calomel and opium, given every hour or two; sometimes with camphor and rubefacients.

43. This disease was very prevalent in Holland, in 1799, particularly in the British troops composing the Walcheren expedition; and proceeded chiefly from endemic causes, and often either followed, or was converted into, intermittent or remittent fever (DAVIS, DAWSON). It was frequently associated with disease of the liver and spleen; and presented the inflammatory, asthenic, and bilious forms. Bleeding, purgatives, calomel, and sudorifics were chiefly employed; but the disease was too generally injudiciously treated.

44. Dysentery became epidemic, in and around Vienna, in autumn, 1809, particularly in the French army; and assumed, according to circumstances, an inflammatory, bilious, adynamic, typhoid, or malignant form (VIGNES). It often was infectious; and few of the medical officers escaped. Ipecacuanha, opium, emollients, clysters, sinapisms, and blisters; camphor, æther, arnica, serpentaria, cinchona, valerian, and aromatics, variously combined, appear to have been chiefly employed.

45. The more simple asthenic states of dysentery were prevalent in Flanders, in July, 1810 (TONNELIER); and, in the summer of 1811, in various parts of the north of France (CARON). In some villages, nearly all the inhabitants were attacked the same day. Ipecacuanha, gentle purgatives, rhubarb, calumba, simarouba, mucilaginous clysters, opiates with diaphoretics, warm baths, arnica, aromatics, HOFFMANN'S anodyne, &c., were generally employed. Favourable changes occurred between the tenth and fifteenth days. The disease sometimes passed into enteritis, and was occasionally followed by dropsy.

46. Dr. PISANI states, that dysentery of an asthenic kind, but presenting either inflammatory, malignant, or nervous symptoms, was so prevalent in the garrison of Mantua, in 1811 and 1812, that about 1000 cases were received into the hospital. It first appeared in some felons; from whom it extended to the soldiers in the wards, and by them was conveyed into the barracks. The medical attendants and assistants were attacked; but those who had no communication with the sick escaped. Small depletions, ipecacuanha, laxatives, emollients; with nitre, fomentations, mucilaginous clysters, neutral salts, rhubarb, HOFFMANN'S anodyne, camphor, and wine, according to the features of the disease, were most employed. Ventilations and fumigations were also resorted to.

47. In the expedition to New Orleans, dysentery, owing to cold, moist, and miasmatic air, wet clothing, and the use of foul, brackish water, and fatigue, was the most fatal disease, assuming inflammatory, bilious, asthenic, and malignant forms. Bleeding, emollients, fomentations, opium, Dover's powder, and very large doses of calomel, appear to have been principally confided in. In fatal cases, the liver was frequently found diseased; and the colon very slightly ulcerated, but not sphacelated. — (*Edin. Med. Journ.* vol. xii. p. 136.)

48. Dysentery, although it may not be said to have been epidemic in the strict sense of the word, was the most fatal disease in the British army during the Peninsular war. It was often connected with intermittents and remittents, and frequently supervened on these and other forms of fever (Sir J. M'GRIGOR); and attacked convalescents. It assumed inflammatory, bilious, typhoid, or malignant and chronic forms, according to the causes and concurrent circumstances. It was most prevalent and fatal at Ciudad Rodrigo, which was obliged to be made an hospital station for a time; and where, shortly before, "nearly 20,000 bodies were calculated to have been put into the earth, either in the town or under its walls, in a few months." It was unhealthy, independently of this circumstance. It was commonly treated by venesection, in the first stage; and by the warm bath, full doses of Dover's powder every hour, calomel and opium at night, sulphate of magnesia, in broth, in the morning; in the second stage, by demulcents, aromatics, opium, astringents, tonics, and flannel rollers.

49. This disease has been more or less prevalent in some part or other of Ireland, owing to the presence of endemic and even of epidemic causes. During 1817, 1818, and 1819, it was, conjointly with fever, epidemic throughout the island. The seasons were cold and wet; and, with this cause, famine, unwholesome food, and infection concurred. It was very often consequent upon the early stage of fever, or it appeared as a crisis of fever, or it occurred during convalescence. It was infectious in circumstances favouring this property; and presented inflammatory characters, but often associated with the asthenic diathesis. It was treated chiefly by moderate bleeding, ipecacuanha, the warm bath, opium in doses of four or five grains, calomel with opium, copaiba mixture, and farinaceous diet (CHEYNE).

50. It was prevalent in several parts of Ireland, in 1822, at the same time with low fever, owing to scanty and bad food. It commenced with debility, pain about the umbilicus, mucous dejections, general cachexia, rapid and weak pulse, &c.; on which the pathognomonic symptoms supervened in an adynamic form. It was very fatal until wholesome and nutritious food was obtained (Dr. GRAVES, in *Trans. of Irish Col. of Phys.* vol. iv. p. 429.)

51. It was again prevalent in Dublin and the vicinity, in the autumn of 1825, after great heat and drought; affected first the better classes; sometimes appeared as fever for two or three days, and then passed into dysentery; or it occurred during convalescence from fever, and was infectious (Dr. O'BRIEN). It was of an asthenic and complicated form; the skin being of a dirty or dark hue, and harsh to the touch; and was very generally treated by bleeding, in robust persons, at an early stage; by the warm bath, and friction of the surface with camphorated oil; by calomel gr. x., and opium gr. ij., repeated in eight hours, and followed by purgatives, especially castor oil with a few drops of laudanum; by flannel rollers around the abdomen; and by Dover's powder, and the repetition of one or more of these means, according to circumstances.

white races; from insufficient and unwholesome food; and, *endemically* from bad water, marsh effluvia, and animal and vegetable emanations floating in a moist atmosphere. It assumes some one of the asthenic forms, according to the causes which produce it, and the circumstances which influence it in its progress. Even when it appears sporadically, it is more liable to become infectious than in Europeans, owing to its passing more readily into a low, malignant, or putrid form, on occasions of imperfect ventilation or crowding of the sick. In such circumstances, it is sometimes quite pestilential in the rapidity of its dissemination and the extent of its fatality. In its sporadic states, it is frequently *associated* with rheumatism, or the one passes into the other; both generally arising from the same exciting causes—from cold and moisture. It is also very often *complicated* with worms, especially the round worm, in the *prima via*; these being passed with the stools in the advanced stage of the more severe and dangerous cases; and, in its less severe grades, it sometimes assumes intermittent or remittent types.

31. When dysentery attacks the dark races *sporadically*, and sometimes, when it seizes Europeans who have resided very long in a warm climate, it frequently commences with chills and much febrile reaction or irritation, the vascular excitement rapidly passing into an adynamic state—into great prostration of the vital and animal actions, and depression of spirits. The pulse is, at first, more or less quick and irritable—sometimes sharp and full; but it always becomes, in the space of one, two, or three days, small and soft. The rapidity of the change is seldom owing either to the loss of blood from the bowels, or to the quantity of matters evacuated, but rather to these conjoined with the exhaustion produced by the causes of the complaint, by the severity of the tormina, the want of sleep, and by the febrile irritation of the system, in less vigorous constitutions than those of the white race. In this class of patients, flatulence, nausea, sometimes porracious or bilious vomiting, quick small pulse, and occasionally scybalous evacuations, often containing worms, are very

52. The disease was epidemic, in some parts of France, in the autumn and winter of 1825 (MM. DENOYER, LEMERCIER, and BIENVENU); and was, in several places, propagated by the exhalations from the sick and the evacuations; children, females, the weak, ill-fed, the aged, and those living near unhealthy and moist localities, being chiefly attacked. It assumed inflammatory, asthenic, and malignant forms; and, in several places, the small intestines and stomach were also affected. It was treated chiefly by local depletions, opium, repeated application of blisters and demulcents. Tonics and antiseptics were required in the advanced stages and chronic states.

53. It again prevailed, in some parts of that kingdom, in October, 1827; and was, in several localities, attributed to the water, which abounded with decayed animal and vegetable matters, animalculæ, &c. (M. COMPAGNY). It presented either inflammatory, mucous, asthenic, or malignant characters; and was treated by leeches, opiates, demulcents, and, afterwards, by camphor and cinchona.

54. The disease was epidemic in Glasgow, in the autumn of 1827, in a simply asthenic and mild form. Opiates, calomel and opium, ipecacuanha, demulcent enemata, blisters, warm baths, astringents, and bitter tonics were most serviceable. Bleeding, unless by leeches, was very seldom required, and was often injurious (WILSON, BROWN, and MACFARLANE.)

55. Infectious dysentery, in adynamic or typhoid forms, has frequently appeared in ships, in prisons, and wherever many persons have been collected in ill-ventilated, and particularly in moist and miasmatic situations. Instances of such occurrences are so numerous, have been so often noticed, and are so well known, that it is unnecessary to refer to them.

early observed; the surface of the body being shrunk, the superficial veins deprived of blood, and the extremities moistened by a colliquative sweat. In these persons, however inflammatory the disease may be at its commencement, it soon exhausts vital power, and passes into the asthenic form; and, in seasoned Europeans, is sometimes contingent on, and *complicated* with, disease of the liver, or of the spleen, or even often of the absorptive glands; or is consequent on fevers, both periodic and continued, either in their course, or during convalescence from them.

32. III. OF THE TYPE OF DYSENTERY.—The inflammatory typhoid, and more malignant forms of the disease, are generally continued, or obscurely remittent. But the other forms may assume an obviously remittent, or even an *intermittent* type, owing rather to the concurrence of the causes to which periodicity in fever is owing, than to those on which the dysenteric phenomena are more immediately dependent, than to the production of two distinct kinds of disease. We have seen, that dysentery often arises from endemic causes, very nearly similar to those which produce periodic fevers; the causes of the latter chiefly impressing the nervous system, those of the former vitiating the secreted and circulating fluids, and disordering the functions of the bowels. Therefore, when both kinds of causes concur, as they frequently do, in unhealthy situations and seasons, a form of disease is directly produced, in which many of the characters of both disorders are blended. In such cases the ingestion of bad water, or of unwholesome food, and cold and moisture, contaminate the fluids, determine thereto, and irritate, the *prima via*; whilst malaria concurring with these causes, impresses the nervous system so as to impart a certain degree of periodicity to the morbid actions resulting from the combined agents. It also not unfrequently occurs that during the progress of agues and remittents, the secretions accumulated in, or poured into, the intestines will acquire such irritating or morbid properties as to superinduce dysentery, which will often for a while retain the periodic character; but, in most instances, a continued or obscurely remittent type will be the consequence of this change. A distinctly intermitting type is incompatible with either a considerable extent of inflammation, or much depravation of the circulating fluid; and one or other, or even both, of these changes obtain in those forms of this disease which I have stated to be generally exempt from this character. It is frequently observed, that when animal or infectious emanations enter largely into the causes of the disease, it assumes a continued and more or less malignant character. Numerous instances, illustrative of these views, came before me in warm climates; and the histories of the epidemic occurrences of the disease, when examined in their details, further confirm them. Sir J. M'GRIGOR, in his excellent review of the diseases of the army during the Peninsular war, states, that, in the hospitals in the Alemtejo and Estremadura, the type of dysentery was intermittent; that it became remittent in July, August, and September, when the army advanced rapidly and remained some time stationary in the two Castiles; and that it was continued, typhoid, and very fatal, at Ciudad Rodrigo, where the sick were exposed to the effluvia intricated by twenty thousand dead bodies. Here we

see the disease presenting increased grades of severity as the causes augmented in intensity.

33. IV. COMPLICATIONS. — Having considered the forms of dysentery depending more directly upon the nature of the predisposing, exciting and concurrent causes, I now proceed to notice those complications occasionally observed, especially in unhealthy seasons and localities. Many writers conceive that the asthenic varieties described above are complications of simple dysentery with different kinds of fever; and that, when they are infectious, it is not the dysentery but the fever which possesses this property. Some authors suppose that the typhoid variety especially is a complication of this description. But, if such be the case, wherefore should the disorder which is communicated be always dysentery and not fever? Moreover, this form of dysentery is often present where a case of typhus cannot be found. The fact is incontrovertible, that the asthenic forms, some of which are considered as complications by many writers, are direct, and necessary, and uniform results of certain diversified but concurrent causes; and not contingent associations of two diseases capable of separate existences, such as those about to be described: thus, cold and moisture will of themselves sometimes occasion simple inflammatory dysentery — as frequently occurs, where no other causes can be in operation; but when, with cold and moisture, there concur malaria, unwholesome food or water, or emanations contaminating the fluids, as is often the case, the disease assumes some one of the more severe and asthenic forms; the nervous and circulating functions having been thereby more seriously impressed. The local affection is occasioned, in these cases, by the nature of the ingesta, or by the morbid secretions consequent upon the action of the exciting causes, or by the retention of morbid or fecal matters, or by two or all of these combined. (See § 70—72.) The complications of which more particular notice will be here taken are most commonly occasioned by the endemic causes of dysentery, and are those — (a) with diseases of the liver, spleen, and some other abdominal viscera; — (b) with jaundice; — (c) with scurvy, or scorbutic dysentery; — (d) with worms in the *primæ viæ*; — (e) with hæmorrhoids; — and (f) with rheumatism.

34. A. *Dysentery complicated with Disease of the Liver, Spleen, &c.* — *Hepatic Dysentery* of writers on intertropical diseases. — (a) I have already noticed an asthenic form in which the bile is excreted more or less in excess, or is otherwise disordered. In this form, which is frequently epidemic, there has generally taken place, for some time previously, an accumulation of this fluid in the biliary apparatus, without any actual disease of the liver; the discharge of much altered or acrid bile contributing, probably, with other morbid secretions and actions, to the production or perpetuation of the dysenteric symptoms. But, in the complication now about to be considered, the liver is generally inflamed, enlarged, or otherwise altered in structure, either previously to, coëtaneously with, or consecutively on, the dysenteric affection. Although this association of diseases of distinct but related organs is most frequent in the sub-acute and chronic states, it sometimes also occurs in any of the acute forms, as well in temperate as in warm climates; but oftener in the latter than in

the former. It is also consequent upon agues, remittents, and continued fevers; and it is evidently often produced by endemic causes, especially in persons addicted to ardent spirits. When hepatic dysentery proceeds from these causes, the spleen is sometimes also diseased, as well as the pancreas, and mesenteric glands. Sir J. M'GRICOR states, that in the fatal cases of dysentery that occurred in the Peninsula, the spleen was as often diseased as the liver; and that both the pancreas and mesenteric glands were also frequently enlarged or otherwise changed. When acute dysentery is complicated with disease of the liver, this latter is frequently likewise, of an acute or sub-acute character; and consists chiefly of inflammation of the substance of the organ; abscess and the chronic changes of this viscus being more commonly associated with sub-acute and chronic dysentery than with the acute.

35. a. *Acute hepatic Dysentery* generally commences with horripilations, chills or rigors, followed by pains in the forehead; bilious vomiting; bilious and variously coloured stools, voided with scalding at the anus, and urgent tenesmus. The discharges are often at first greenish, greenish black, or reddish brown and ochre-like; or watery, with a greenish frothy slime on the surface. A fixed pain, weight, or uneasiness, increased on pressure, is generally felt in the epigastrium, frequently extending to the right hypochondrium, right scapula, or top of the right shoulder; with a sense of pressure or tension in the right side of the thorax, anxiety at the præcordia, fits of dyspnoea, or a dry teasing cough, vertigo, and an accelerated and irritable pulse, particularly at night, when the patient becomes very restless, and the calls to stool more frequent and distressing. The tongue is at first white, the papillæ erect, or covered by a yellowish fur. At an advanced stage, it is clean, dry, smooth, red, or lobulated; or it is covered at the root with a dark crust. The skin is dry, harsh, of a dirty appearance, and hot; or it is covered by a greasy perspiration, copious sweats sometimes occurring in the last stage of the malady. There is great thirst, and desire of cold fluids. In other respects, the progress of the disease is similar to the more inflammatory form described above (§ 13.); but it often presents a greater range of symptoms in different cases, or at different stages of the same case.

36. β. In the above form of hepatic dysentery, the affections of the large bowels and liver seem to be nearly coëtaneous; but, more frequently, the hepatic disease follows dysentery, or does not appear until this latter begins to decline. In these cases, the patient is irritable, the cheeks present a hectic flush, and, upon examining the abdomen, the right *rectus abdominis* muscle resists pressure by an involuntary action. Little or no enlargement of the organ is at first felt; but either enlargement or tenderness becomes manifest, especially when blood has entirely disappeared from the stools, which are generally scanty, viscid, and dark. This form of the complication is evidently caused by the sudden cessation of the dysenteric affection; which being very intimately dependent upon the excretion of morbid matters from the circulation and the economy in general, cannot be abruptly suppressed; without inducing continued or remittent fever, or inflammation, congestion, or enlargement of excreting organs. Both these mo-

longations of, the acute, they may be the sequelæ of any of the forms of diarrhoea, of common or pestilential cholera, and of fevers that have been neglected in their early stages, or improperly treated. When it occurs primarily; which is comparatively rare, it may, after a considerable time, assume the acute characters.

46. *a.* The Symptoms of chronic dysentery differ chiefly in degree from those characterising the more simple inflammatory form of the acute disease (§ 12, 13.). The fever of the latter generally subsides, especially during the day; and the appetite and strength frequently return for a time. Tormina and tenesmus either altogether disappear, or are present in a slight degree; but sharp, griping pains, and soreness in the abdomen, are often complained of. The stools are more or less serous, mucous, muco-puriform, or gelatinous; contain some fluid fæculent matter, or ill-digested substances; and vary from a white albuminous, or white of egg, appearance, to a dark olive green or greenish black; being sometimes marbled, or one day like chalk and water, and on another like a dark jelly, or the green fat of a turtle. Blood is often either so intimately mixed with the evacuation as to give it an uniform brick-red colour, or is quite distinct and fluid, or partially coagulated. The puriform or muco-puriform matter generally exists as small streaks; but this matter may not be detected, although ulceration of the large bowels is present. The discharges are more copious than in acute dysentery, but much less frequent; being commonly from three or four to ten or twelve in the twenty-four hours. The pulse is not accelerated in the early part of the day, but it usually becomes quicker towards evening; and is feeble, unequal, and sometimes slow, or intermitting. The tongue is often dark red or glossy; the countenance sunk and anxious; the surface cold, lurid, dirty, harsh, dry, or even scaly; the body emaciated; and the abdomen hard, tumid, not very painful on pressure, excepting about the cæcum or sigmoid flexure of the colon, with griping pains in the course of the colon. In the more advanced stages of the disease, the feet and legs become œdematous; the lips and surface exsanguineous; the surface and the evacuations exhale a peculiar, offensive, and sub-acid odour; sometimes jaundice or ascites supervenes, and the patient at last sinks under the irritation and hectic symptoms, after many weeks or even months of continued or remittent suffering.

47. *β.* Chronic dysentery sometimes assumes a modified character, which is essentially the same as the ulcerated and lenteric forms of DIARRHŒA (§ 11, 12.). In these cases, the mucous follicles and coat of the small, as well as of the large, intestines are affected; but in warm climates and unhealthy situations, disease extends much further, and generally comprises lesions either of the liver, spleen, pancreas, mesenteric glands, or of two or more of these. Repeated attacks of dysentery, in these places, frequently terminate in chronic dysenteric diarrhœa in a simple or complicated state; and I have seen cases where it has continued for years, with slight remissions; the stools being lenteric, copious, and crude, and the appetite ravenous. In some cases of this protracted state of disease, especially where the stools are gletty or mucous, and voided

with tenesmus, but without tormina, the rectum only is affected; one or more ulcers being seated at a greater or less distance from the anus. The sub-acute and chronic forms are not infrequent in *children*, are in them often accompanied by *proidentia ani*, and are generally inflammatory, particularly when occurring sporadically. Chronic dysentery in the dark race assumes the appearance of a gletty discharge from the bowels, and depends upon defective tone of the vessels and follicles of the intestinal mucous surface, rather than upon inflammatory action.

48. *ii.* *Complications of Chronic Dysentery* are most frequent in countries within the tropics, and in places abounding with terrestrial emanations. (*a*) When chronic dysentery is complicated with disease of the liver, the symptoms often approach those of diarrhœa; and the hepatic affection is generally latent, insidious, and also chronic; the internal structure of the organ being chiefly implicated. In this state of disease, the evacuations are frequent; attended by griping pains about the umbilicus; and are of a dark green colour, indicating a morbid state of the bile; or of a pale clay colour, showing torpor of the liver or obstruction of the ducts. In some cases, they are dirty, watery, and offensive; and in others, of a whitish appearance: whence has arisen the term "*white flux*." These last seem like chalk or lime mixed in a dirty fluid, or intermediate between this and whites of eggs; occasionally they resemble cream or yeast; and they are often slimy, and contain broken-down, clay-coloured fæces, and half-digested substances. These sometimes continue for a long time; or they change to a darker colour, apparently from a partial discharge of bile or the medicines taken; and afterwards return to their former hue. The state of the dejections is evidently owing to the obstruction of bile, to the consequent impairment of chylification, and to the increased and morbid secretion of the follicular glands and mucous surface. In addition to these the patient complains of tightness, fulness, or oppression at the epigastrium and lower part of the thorax, particularly on the right side; and of slight evening exacerbations of fever. The eyes have frequently a pearly appearance; and the countenance is livid or sallow. This complication is often caused by the excessive use of spirituous and other intoxicating liquors; and by the concurrence of the causes of hepatitis with those of dysentery, and it frequently is consequent upon hepatitis, upon intermittent, remittent, or continued fever, and upon the acute disease, when it arises from endemic causes. The dysenteric symptoms are manifestly occasioned or perpetuated either by a morbid condition, or by deficiency, or total obstruction, of bile: this secretion being indispensable to the due performance of the assimilating processes, and to the healthy state of the mucous surfaces and follicles. In other cases of this complication, the enlargement of the liver, or the symptoms of hepatic disease, are less equivocal, and approach more nearly those stated above (§ 35. — (See, also, LIVER — Abscess in.)

49. (*a*) — *a.* When chronic dysentery follows the diseases just now mentioned, or the prolonged or intense operation of endemic causes, it may become associated with scorbutic symptoms; or

pain more violent, particularly around the umbilicus, than in this disease; the matters received into the stomach being ejected from it without exciting either a desire for stool, or tenesmus. It should, however, be kept in recollection, that the bilious or endemic colic of warm climates (see COLIC, § 16.) in some cases differs but little from dysentery, and that chiefly as respects the more complete retention of the morbid secretions and excretions, as will be seen from the history of both diseases.

67. (c) *Internal Hemorrhoids* sometimes give rise to symptoms resembling dysentery, — or rather to tenesmus, an affection entirely of the rectum, the seat of these internal tumours. The tenesmus of hemorrhoids, whether attended by discharges of blood or not, is strictly a local complaint, is seldom severe or preceded by tormina, or frequent calls to stool, or much constitutional disorder; and is a simple obstruction to the passage of consistent stools, which are not mucous, and not streaked with blood, which, if passed at all at stool, is entirely distinct from the fecal evacuation; the hemorrhoidal tumours often protruding at the time. These, independently of the different circumstances under which both diseases occur, and the history of their progress, are sufficient to distinguish them from one another.

68. IX. PATHOLOGICAL INFERENCES. — i. THE MODES OF OPERATION OF THE CAUSES. — There is, perhaps, no other disease which requires a more accurate analysis of its pathological conditions, with strict reference to their causes, than dysentery, for these causes induce so very different states of morbid action in connection with that which especially constitutes the malady, that the practitioner will often attempt in vain either to limit its spread, in circumstances requiring this precaution, or to arrest its progress in particular cases, without being acquainted with the operation of its diversified causes upon the system, and the nature of the effects they induce.

69. 1st. *Operation of causes which dispose to the disease* (§ 9. 22.). — These, when their nature is known, and their mode of operation ascertained, may be sometimes averted, and an attack thereby prevented, especially when the malady is prevalent. — (a) High ranges of temperature, and consequently hot seasons (PISO, HILLARY, STRÖM, HUFELAND, &c.) and climates, so very generally predispose to dysentery, that it most commonly occurs either during, or subsequent to, these states of atmosphere. The effects of a high temperature upon the pulmonary functions, and consecutively upon the blood, and the biliary and other secretions and excretions, are such, as fully explained in the article DISEASE (§ 32—34.), as greatly to increase and disorder these latter, especially when the circulation is determined towards the abdominal organs by exposure to cold, or when assisted by other concurrent causes. — (b) Peculiar states of air, connected with the epidemic manifestations of the disease (HUXHAM, HORN, SCHMIDTMANN, &c.), and with certain features which different epidemics often present, whether referred to noxious exhalations floating in this fluid, or to extreme humidity, or to electrical conditions of it affecting the electromotive states of our frames, most probably influence the organic or vital actions, especially the circulating and secreting functions, in such a manner — although slightly or latently — as to render

them remarkably liable to this species of disorder upon exposure to any of the exciting causes. And it is not improbable that these states, as well as high ranges of temperature, favour the production and accumulation of morbid secretions in the biliary apparatus and in the prima via; and that these secretions, aided by consecutive causes, induce that form of action constituting the disease, although tending to their evacuation from the frame. — (c) An asthenic or exhausted state of the constitution, and of the digestive canal in particular, insisted upon by MARCUS, has certainly no mean influence as a predisposing cause, as shown by the greater prevalence of the disease in persons of this description in all climates and in most epidemics, in soldiers after very fatiguing marches, and in convalescents from fevers and other diseases. — (d) To these may be added the use of intoxicating fluids, as disordering both the digestive mucous surface and the secretions poured into the intestinal canal.

70. 2d. *Of the operation of causes which, either individually or conjointly, excite the disease.* — A. *Those which act locally, or affect chiefly the large bowels.* — (a) Many of these irritate or inflame the mucous surface of the cæcum, colon, and rectum. These bowels perform chiefly an excreting function; and consequently, when the excretions which are proper to them, as well as those which are poured into them from the small intestines, are allowed to accumulate, irritation or inflammation of the mucous surface, with inordinate action of the muscular coats, may be expected to occur. Irritating purgatives, injudiciously prescribed; a dose of rancid castor oil; foreign bodies lodged in the intestines; the too liberal use of fruit, especially that which is unripe (HORST, GIRTANNER, M'GRIGOR, &c.), or the fruit of hot climates (BÜCHNER, TWINING, myself, &c.); various indigestible substances; uncooked or imperfectly cooked meat or other food; pork; sour or bad wine; minute insects, or their ova and animalcules, in the water used for drink (LINNÆUS, SEBASTIAN, MAY, LATREILLE); and intestinal worms (constituting the *Dysentaria verminosa* of BONET, MAY, and BAUME); seem to act in this manner. — (b) Several agents determine inflammatory irritation of, and an inordinate flux of fluids to, the mucous surface of the large bowels, and their usual results. The causes just enumerated necessarily act in this manner, although not so immediately, nor to the same extent, as the following: — Exposure to cold, or cold and moisture, especially during or immediately after great atmospheric warmth, has been considered by BÜCHNER, STOLL, FISCHER, LARREY, and others, to produce the disease, and at the same time to impose on it a rheumatic character; whilst OSIANDER considers that, of itself, cold will not have this effect; and that the presence of morbid matters in the prima via, or the concurrence of some other cause, is necessary to its operation. The influence of the causes of common catarrh, insisted on by STRÖM, SCHLEGEL, and NEUMANN, although not so great as these writers suppose, is often well marked, especially in sporadic cases, and in some seasons. These, and several other authors, consider that the disease is catarrh, or catarrhal inflammation, of the large bowels, from remarking its prevalence about the same time as that affection. The sup-

pression of other evacuations, or the drying up of accustomed discharges, and misplaced gout (MUSGRAVE, STOLL, &c.) — the *Dysenteria arthritica* of SAUVAGES — are probably also concerned in its production in some instances; contingent circumstances causing the determination of morbid action to this quarter.

71. *B. Causes which disorder the secretions poured into the intestinal canal, and thereby affect its mucous surface.* — (a) Suppression of the secretions and excretions poured into the large bowels, especially the biliary fluid, and accumulations of mucus in the follicles, are not altogether without effect in causing or prolonging the disease, especially some of its protracted states; and several of the exciting agents, particularly cold, moisture, and malaria, partly act in this way. In many cases, both sporadic and epidemic, the absence of bile from the stools is a prominent symptom; the free discharge of this fluid being generally followed by more or less rapid amendment. Deficiency of this secretion evidently renders the chyle irritating or otherwise hurtful to the bowels; their mucous surface and follicles being moreover deprived of the salutary influence which a healthy state of this secretion exerts upon them; whilst accumulations of mucus in these glands irritate or inflame them, and favour the changes they usually present in fatal chronic cases. — (b) Other causes may operate by changing one or more of the secretions poured into the large bowels, either in quantity or quality. Thus, excess, and acridity with excess, or even with diminution, of these secretions, may irritate or excoriate the villous surface of the large bowels, during a prolonged retention of them occasioned by the conformation of the cæcum and colon, and by the spasmodic action of the muscular fasciculi of the latter. Many endemic causes act by disordering or vitiating the abdominal secretions and excretions, especially those of the liver (FORSTER, WENDELSTADT, FISCHER, BRÜNING, &c.); and antecedent diseases, as agues, remittents (PRINGLE, HUNTER, J. M'GRIGOR, FERGUSON, &c.), and continued or epidemic fevers (CHEYNE, O'BRIEN, &c.), operate in a similar manner. Pre-existing affections, also, of the collatitious viscera, particularly of the liver (PISO, MENJOTUS, JUNCKER, BOAG, BIANCHI, J. JOHNSON, &c.) and Pancreas, have a still more common and manifest agency; and it is probable that the influence of imagination, fear, and terror, mentioned by HOFFMAN, VOGEL, HARGENS, and NAUMANN, is exerted through the medium of the secreting organs, as well as upon the bowels themselves.

72. *C. Other causes seem to affect the intestinal mucous surface, the secretions poured into the canal, and the circulating fluids, disordering, also, the organic nervous influence by which these are controlled or modified.* — (a) The use of unripe and blighted grain (WRIGHT, GEDNER, &c.); of the flesh, and especially the viscera, of diseased animals (HOEPFNER, &c.); famine and unwholesome food (MUHLIUS, DESOENETTES, VIGNES, GRAVES, &c.); water holding putrid animal and alkaline substances in solution (PRO-COPPIUS, RHODIUS, MOEGLING, BIRNBAUM, BELL, &c.); and stale fruit or vegetables, act in this complex manner; putrid water especially exerting a septic action upon the digestive mucous surface, upon the circulation, and, ultimately,

upon the soft solids. — (b) The causes which produce scurvy also give rise to scorbutic dysentery (§ 39.), by a nearly similar mode of operation. — (c) Morbid matters absorbed from ulcerating surfaces and parts, especially from sloughing, malignant, or phagedenic ulcers, by contaminating the blood, disorder the secretions, poured into, and those elaborated by, the intestinal canal, so as frequently to occasion asthenic dysentery or diarrhoea. Of this form of the disease, numerous instances occurred in naval and army hospitals during the war. Mr. COPLAND HUTCHINSON has devoted a chapter of his able "*Practical Observations on Surgery*," to this procession of morbid action, as it occurred in the navy, during his extensive public service.

73. *D. Lastly, some causes, and these the most energetic, affect the circulation, and, through it, the secretions poured into the bowels; ultimately contaminating, more or less, the solids as well as fluids, and disorganising the intestinal canal, so that the disease be not arrested in its progress.* — (a) Miasmatic exhalations (LIND, KREYING, MICHAËLIS, &c.); the emanations from animal exuvie (OSIANDER, &c.); or a mixture of both (ANNESLEY, myself, and others); and the effluvia proceeding from the bodies of a number of persons confined in small space, and in a close air (ATCHESON, &c.); by vitiating the air used in respiration, affect the whole mass of blood as it circulates through the lungs; those organs, especially the liver, whose office it is to eliminate injurious matters from the circulation, and thereby to preserve the purity of this fluid, necessarily forming, from the morbid elements furnished them in it, acrid, septic, or otherwise morbid secretions, which, as actually proved by experiment, irritate and excoriate the tissues with which they remain any time in contact. — (b) No doubt can be entertained by any one whose range of observation has embraced the more asthenic varieties of the disease of the emanations which proceed either from the bodies of the affected, or from the faecal discharges in circumstances of concentration, and of predisposition on the part of those exposed to them, being capable of producing and spreading the malady, either in the manner now stated in respect of other animal emanations, or through the medium of the saliva and upper portion of the digestive canal. The contagious properties of dysentery have been keenly disputed by WILLIS, PISO, STOLL, HORN, VANDER HAEGH, RENTON, BALLINGALL, &c., asserting that it does not possess these properties; and HONSTIUS, FORESTUS, HILLARY, MORTON, PRINGLE, BARNES, BRUNING, BALFOUR, J. HUNTER, CHILBOIS, OSIANDER, NEUMANN, BONER, HARTY, HARGENS, G. BLANE, HUFELAND, PENADA, MICHAËLIS, HALLORAN, POOLE, CHEYNE, C. HUTCHINSON, RUTHERFORD, JONES, and others, contending that it generally is infectious, especially when epidemic, or when occurring in camps, crowded ships, and under circumstances contended for above (§ 24.), and more fully illustrated in the article INFECTION. I believe that the views exhibited at these places are conformable with those entertained by every well informed and experienced observer and writer at the present day.

74. *ii. MORBID CONDITIONS.* — A. It is impossible to contemplate aright the changes constituting the various forms and stages of the disease, and

from its causes and their modes of operation. — (a) Many of these affect more or less immediately the large bowels, without any previous constitutional derangement (§ 70. A.); and accordingly the morbid action is chiefly local, sthenic, or phlogistic in its character, as described under the first species of the disease (§ 12, 13.), and, in many instances, is simply inflammation of the cæcum and large intestines. — (b) In cases produced by suppression or vitiation of the secretions poured into the bowels (§ 71. B.), previous disorder, of either a latent or manifest kind, is necessarily present; diarrhoea frequently ushering in the disease; and the local affection, as well as the constitutional disturbance, evincing more or less of sthenic or asthenic characters, according to the state of the patient and the nature and concurrence of the causes. Some of these are also consecutive, complicated, chronic, or even symptomatic, hepatic dysentery belonging to this class of cases. — (c) In most such cases, and in many of the simple as well as of the most severe forms, congestion of the portal vessels, and obstruction of this part of the circulation, are concerned in the production and perpetuation of the dysenteric symptoms. — (d) Although dysentery is frequently occasioned by offending matters in the *prima via*, as believed by SYDENHAM, and many others, yet these matters are not so generally retained, either in the form of scybala, or in any other state, as CULLEN, and many more recent writers, seem to have supposed. — (e) There appears not to be sufficient evidence of the inflammatory forms being rheumatic in their nature, as suggested by VOGLER, STOLL, RICHTER, FISCHER, SIMS, SCHMIDTMANN, HUFELAND, HARGENS, &c.; although both complaints are sometimes allied, especially in respect of the exciting causes, as justly remarked by AKENSIDE, &c., and are occasionally associated, or consecutive the one of the other. — (f) In cases that proceed from unwholesome food or water (§ 72. C.), and in those caused by animal exhalations and infectious effluvia (§ 73. D.), although there may be at the commencement excited vascular action, the circulating and secreted fluids, and ultimately the soft solids, become more or less contaminated, and the disease assumes either a simply asthenic, or malignant form, disorganisation of the internal surface of the large bowels often taking place earlier than in other cases, with the exception of the hyper-acute inflammatory form met with in hot climates. In most of these malignant cases, the vitiated or morbid matters either conveyed into, or generated in, the circulation, in the process of their discharge by the emunctories give rise to an acrid or excoriating state of the excretions (or the morbid action excited in the secreting organs and surface occasions this change in the fluids they elaborate, as occurs in coryza, &c.), together with an increase of their quantity; but these changes frequently occasion at the commencement merely diarrhoea; the dysenteric symptoms being consequent upon the evacuation of the intestinal contents, and caused by the excoriation of the mucous surface, by the vitiated secretions, and by the irritation of the muscular coat; the local disorder reacting upon the constitutional disturbance.

75. B. In the early stage of most forms of the disease, the irritating effects of the morbid secretions and excretions are first exerted upon the

cæcum and rectum; the latter being often so spasmodically constricted as not to allow the discharge of the more solid matters that may exist in the bowels; the retention of these and of the fluid secretions increasing the diseased action in the large, and ultimately in the small, intestines; ulceration, excoriation, sphacelation, &c. being frequently the result. — (a) In those cases which originate in a morbid state of the secretions, &c. (§ 74. b. c.), faecal matters are generally fully evacuated before the tenesmus, distinctive of this affection of the rectum, comes on; the only morbid matters retained being those thrown out upon the mucous surface of the intestines, and poured into them from the collatitious viscera; but these are so vitiated and injurious, that their correction or evacuation becomes indispensable.

— (b) In the asthenic varieties, to which most of such cases belong, the dysenteric symptoms are consequences chiefly of the vitiated secretions poured into the large bowels; this vitiation resulting from constitutional disorder, and the state of the circulating fluid: these morbid conditions should, therefore, be made objects of primary attention in the treatment of the disease. —

(c) The matters poured into, and retained in, the large bowels, in asthenic cases especially, are to be considered as formed of elements which would be speedily noxious if retained in the circulation: they are excretions, in the strictest sense of the word, removed chiefly by the liver and digestive mucous surface; occasioning, from the morbid elements of which they are composed, and acrid properties they possess, severe irritation of the parts upon which they are retained, or along which they pass, in the progress of their discharge from the body. — (d) Granting that the dysenteric phenomena are thus produced, and that the morbid matters causing them are thus formed, it is manifest, that the mere suppression of these phenomena, or the retention of the morbid excretions, must be followed by disorganising effects upon the large bowels; and that the suppression of the secretions, being an arrest of the depurating functions, must be productive of a still more serious change in the circulating fluid, and ultimately in all the soft solids. — (e) In many cases of all the forms of the disease, the excreting function of the skin is more or less completely put a stop to, and that of the kidneys materially impeded; the excretions of the intestinal canal, and frequently those of the liver, being in excess, as well as otherwise disordered, — conditions, equally with the foregoing, requiring to be made the basis of therapeutical indications.

— (f) Whilst, therefore, the cutaneous and urinary excretions are interrupted, the sudden arrest of those poured into the intestinal tube would endanger the patient, by increasing the morbid state of the circulation, and by superinducing either fever of a bad form, or inflammation and its consequences in the abdominal organs, or dropsy. — (g) In the varieties consequent upon a morbid state of the secretions poured into the bowels, the small intestines are frequently also diseased, but in a less degree than the large, as they present no obstacle to the speedy transit of these secretions along them, excepting near the cæcum, where they are usually more altered than in any other part.

76. C. The most frequent association of dysen-

tery, and one often very imperfectly manifested by symptoms, is that with *disease of the liver*. — (a) The *hepatic affection* may be *primary*, in which case it is either *functional* or *structural*; the *functional disorder* consisting — *a.* of torpid or suppressed function and passive congestion; or, *β.* of increased secretion, and of the vascular determination requisite to such increase; — the *structural disease* being — *a.* *acute*, or consisting of active congestion, or inflammation, or of abscess in the substance of the organ; or, *β.* *chronic*, with various alterations, occasioning obstructed circulation through the portal vessels, and an insufficient as well as a morbid biliary secretion: in these states, the bowel complaint may be viewed as *symptomatic* of the hepatic disease. — (b) The affection of the liver may be a *coincident effect*, with that of the bowels, of the same causes: in this case, the former will be of the *functional* and *acute* kinds enumerated above; *abscess* occasionally supervening in the advanced stages of the associated malady. This form of complication is most common in warm countries, where, the causes of both diseases being nearly the same, these associated results may reasonably be expected. — (c) The hepatic change may be *consequent upon the dysenteric malady*, especially in its more chronic states. In cases of this description, the substance of the liver is either inflamed, softened, and discoloured; or it contains one or more purulent collections, with or without any surrounding cyst; the matter being sometimes infiltrated into the softened, and apparently not inflamed structure of the organ. Here the hepatic change is contingent upon the bowel disease, in its advanced stages, and is favoured by constitutional vice or injudicious treatment, or both; and occasionally by the nature of the predisposing and exciting causes, as by habits of intemperance. In these three states of this important complication, the symptoms are often obscure. In the *first* and *second*, they are frequently very manifest; but, in the *third* especially, they seldom admit of more than suspicion, arising from the obstinacy of the disease, the lurid and lightly jaundiced appearance of the surface, the morbid state of the biliary and other secretions, and the irregular or hectic form of febrile disturbance; chills, rigors, or even horripilations, being seldom felt. The severity, also, of the dysenteric symptoms sometimes masks, or draws off the attention of both patient and physician from, the hepatic disorder.

77. The frequency of the *third, latent, or superinduced form* (§ 76. c.) of *hepatic complication*, especially in the more chronic cases of dysentery, has given it much practical importance; and, as a knowledge of the manner in which it arises is necessary both to its prevention, and to its removal, several attempts at explaining the occurrence have been made. These have been remarkably vague and unsatisfactory. I shall therefore state, with but little reference to them, the only ways in which it can be brought about. — 1st. The irritation and increased vascular action in the intestinal canal must necessarily be followed by augmented circulation through the portal vessels, by a more copious secretion of bile, and, if at this time the liver be congested, or its ducts loaded, and especially if the blood abound with excrementitious elements, by an

acid and morbid, as well as augmented, secretion. — 2d. The absorption of injurious ingesta, or of morbid matters formed or retained in the *primæ viæ*; or of puriform matter from the inflamed or ulcerated mucous surface, into the mesenteric veins and portal circulation, must necessarily be productive of the following effects: — *a.* A vitiated, or an increased, or both a vitiated and increased, secretion of bile; — *β.* Irritation of the structure of the liver, followed by inflammation or softening, often rapidly passing into suppuration without much tumefaction or previous stasis or phlogistic action; — *γ.* The deposition or infiltration of puriform matter in the substance of the organ, especially when a puriform fluid is carried from the diseased bowels; — *δ.* Inflammatory action, and its consequences, in the vessels along which the morbid matters pass, and on the blood they contain. — 3d. It is extremely probable that inflammation extends from the ulcerated mucous or submucous membranes to the radicles of the veins and from thence along their ramifications and trunks, the product of the morbid action mixing with and contaminating the blood which circulates to the liver, as in the foregoing — the 2d — case, and producing the same effects, the inflammatory action extending more or less to the ramifications of the portal vessels. It seems very probable that the above are the chief modes in which disease of the liver is superinduced in the course of dysentery; and that one or all of them more or less obtain, in different cases, or even in the same case. Without, however, denying the process of morbid action contended for by some writers, and about to be noticed, something takes place, I may state, in support of the preceding, that M. RIBES (*Revue Méd.* 1825, t. i. p. 5. et seq.) found puriform matter in the veins and inflammation of their coat, in several cases where purulent collections had formed in the liver after ulceration of the inner surface of the bowels. M. GENDRIU (*Hist. Anat. des Inflamm.* t. i. p. 707.) observed similar changes in the veins in the vicinity of intestinal ulcers; and M. ANDRAL (*Anat. Pathol.* vol. ii. p. 421.) detected false membranes lining the ramifications of the vena portæ, in a person who died from disease of the bowels and liver. The very frequent collections of pus, and puriform infiltrations in the mesenteric glands, in the protracted states of dysentery, should also not be overlooked, as supporting the above inferences, especially if we take into account the intimate connection of the portal system with the veins contributing to form the portal system. — 4th. It has been supposed by M. BROUSSAIS and his followers, that inflammatory action extends from the small intestines, along the bile ducts, to the liver; and some cases, that have been observed by him, Mr. NESLEY, M. ANDRAL, and myself, where inflammatory action or its results were seen in the common and cystic ducts, would seem to favour this view, if they could not be otherwise accounted for. It may be admitted, that the extension of disease to the small intestines, is very frequent in the hepatic complication; but it is most probably excited, as stated above (§ 75. c.), by morbid bile which also may have produced the inflammatory appearances occasionally observed in the ducts by which it is excreted. — 5th. The irritation of the bowels, or the operation of substances given

to cure the disease, may be sufficient to excite a sympathetic irritation, and its occasional consequence—suppuration—in an asthenic state of the system, in an organ so intimately connected, with its circulation and nervous influence, with the bowels, as the liver is. This, certainly, may possibly occur, but we have no proof of it; nor, indeed, does it admit of unexceptionable evidence. It is, however, very likely that the constant, or in judicious, use of calomel and irritating purgatives, when the substance of the liver is congested, and the bowels in a state of irritation, may give rise to necrosis or other structural change in the liver; whilst, on the other hand, a similar practice during hepatic disease, may superinduce dysentery, without removing the primary complaint.

78. *D. Chronic* as well as other forms of dysentery may be associated with disease of the spleen, pancreas, or mesenteric glands; either, or even all, of which may occur, and indeed, often does occur, in the same case, especially where endemic causes are in operation,—the hepatic complication being sometimes also superadded.—(a) As respects the disease of the spleen and pancreas, the procession of morbid phenomena is not often manifest; but these lesions are most frequently seen where dysentery has arisen from these causes, or has been consequent upon periodic or continued fevers; the splenic enlargement having often preceded the bowel affection.—(b) In respect of the lesions of the mesenteric glands, there can be no doubt of their being the results of intestinal irritation or ulceration; the most remarkable changes, especially purulent collections, having been seen in those corresponding to the seat of large ulcers.

79. *E. Relapses*, or repeated attacks after the patient has once had the disease, are very common, especially if he remain exposed to the endemic or other exciting causes, as in hot climates and during campaigns or sieges; or if he be addicted to intoxicating liquors. They are also frequent when the complaint has been associated with affections of the liver, or spleen, or consequent upon obstinate intermittents, and when recovery had not taken place until after it had assumed a chronic state. In such circumstances, slight errors of diet, or exposure to cold, and noxious emanations, will often speedily reproduce it. The numerous *relapses* observed in unhealthy localities, and amongst soldiers and sailors, are chiefly attributable to a too early discharge from medical care, and return to irregular habits and injurious exposures; and to the abrupt resumption of a stimulating diet.

80. *X. TREATMENT.*—Towards the close of the last century, and at the commencement of this, the treatment of dysentery, as set forth in various papers and works, by authorities confided in at the time, was absolutely below the standard furnished by the ancients, and by writers in the sixteenth and seventeenth centuries, not merely in respect of the knowledge and appropriation of therapeutical means, but even as regards the justness of pathological views; without which, indeed, no medicinal agent can be even safely prescribed. If any one think this assertion paradoxical, let him refer to the sources pointed out to him in the sequel; and, with a slight allowance for phraseology, he will perceive that, as to this disease, as well as to many others, knowledge has not been

always progressive; and that the unsound and narrow doctrines in medicine that sprang up soon after the middle of the last century, have contributed not merely to its retardation, but to its retrogression. The cant about experience, so recently raised, and kept up by those the least entitled to the distinction it should rationally confer, threatens an equal, although very different, obstacle to the progress of medical knowledge, by being made without reference to the fact, that experience in medicine consists not in opportunities, or the number of objects seen, or even in the repetition of the same experiments or observations; but in the qualities of the mind of the observer; in due preparation for the task by literature, philosophy, and science; and in the application of them to the objects successively investigated. Thus qualified, opportunities will seldom be wanting, and the results will soon accumulate so as to enrich the mind of the inquirer to an extent to which the empirically—the ignorantly experienced, will ever remain a stranger; and will be of such a description, as can be attained only by a mind so constituted, and so instructed.

81. *i. OF ACUTE DYSENTERY.*—*The general indications of cure*, are—1st. To remove the causes predisposing, exciting, and concurring; and when it is requisite, or circumstances will permit, to place the patient in a pure and open air.—2d. To subdue inflammatory action by antiphlogistic measures when its presence is rationally inferred, or when the state of the attendant constitutional affection will admit of them, or to the extent to which it may be benefited by them.—3d. To promote the excretions of the skin and kidneys, and to determine the circulation to the cutaneous surface.—4th. To remove, by gentle and appropriate means, the morbid matters that may remain or collect in the *prima via*, and to dilute and correct them.—5th. To protect the mucous surface of the bowels from their irritating and excoriating action.—6th. To correct the morbid condition of the circulating and secreted fluids, in the asthenic and malignant varieties, or whenever this condition may be inferred, conformably with the views explained in the articles BLOOD, DEBILITY, DISEASE, and SYMPTOMATOLOGY.—7th. To support vital power, if it fail in the progress of the sthenic forms, and early in the asthenic varieties, as being indispensably requisite to the correction of a morbid state of the fluids.—And 8th. To palliate urgent symptoms, or to arrest such as are attended by immediate danger, as soon as they appear. An appropriate use of energetic means will generally accomplish, simultaneously, two or more of these intentions.

82. *A. TREATMENT OF THE STHENIC FORMS.*—(a) *Bleeding*, general, or local, or both, according to the severity of the disease and constitution of the patient, and repeated accordingly, is generally requisite. The application of a number of leeches to the abdomen in the slighter cases, or after venesection in the more severe attacks, and of fomentations, or warm poultices, frequently renewed, after the leeches have fallen off, will give much relief. If tenesmus or dysuria be urgent, and pain be felt along the sacrum, the leeches may be placed there or on the perineum, or cupping on these parts may be directed. Although vascular depletion is most serviceable early in the disease, yet it should not in these forms, be

neglected in the advanced stages, when it has been either omitted, or directed in too small a quantity, unless the symptoms are such as contraindicate it. When fixed pain is felt in the region of the cæcum, or in the course of the colon, leeches should be repeatedly applied until it is removed.

83. (b) *Purgatives and laxatives* have been long recommended, and employed with a most injurious want of discrimination, on the supposition that the disease is caused, and kept up, by the lodgment of fecal matters in the colon; and yet, notwithstanding the general fallacy of the views which led to their employment, when judiciously selected and combined, they are often of much service. It must be obvious that such purgatives as act principally on the colon and rectum are not suited to an inflammatory disease of these parts; and that, when there can be no collection of fecal or morbid matters to remove, the exhibition of them will merely aggravate the symptoms. It is, therefore, most important to ascertain, upon entering on the treatment of a case of the disease, as far as may be done, whether or no such matters may exist to the extent of requiring these remedies. If the patient has been seized after a constipated or even natural state of the bowels, if hardness and fulness can be felt in any part of the colon or cæcum upon careful examination of the naked abdomen by the hand; if, together with these, the tongue be much loaded, and the matters evacuated offensive from the commencement; if the patient complain of a sense of stuffing or fulness in the course of the large bowels, and if pellets of feces be evacuated; suitable evacuants are indicated. But, if the disease has been preceded by diarrhoea, or by free fecal discharges, as it frequently is, they should either be withheld for a time, or very cautiously employed; the selection also being made with much care. When the patient is well informed, his sensations and account of the early symptoms should be duly weighed and attended to. Much mischief may arise, and discredit be reflected on the practitioner, by neglecting this very obvious indication—by following blindly the dictates of either unsound theory or worthless authority, instead of being guided by common sense. I have repeatedly known persons who have been accounted ignorant, but who were not necessarily without sound sense, complain bitterly, and lose all confidence in their medical attendant, and hopes of recovery, when directed to take cathartics, after, as they have expressed it, their insides had been nearly purged out of them.—When, however, the patient has not had any feculent discharges for a considerable time, during the progress of the disease, although they may have been copious and frequent before the accession of the dysenteric symptoms, a mild purgative should be prescribed, as being much less irritating than the retention, even for a short time, of morbid excretions; and its operation should be promoted by an emollient enema. Cooling or oleaginous purgatives are preferable to others: and perfectly sweet castor or olive oil; or the following preparation, recommended by VOGEL, and praised by SCHMIDTMANN; or Formulæ 144. and 790.; or either of the subjoined electuaries; may be tried:—

No. 199. R. Extr. Jalapæ Resin. gr. xij. ; Sap. Venet. gr. vj. ; tere probe cum Olei Olivæ (vel Ol. Lin.) vel Ol. Amygdal. Dulc.) 3 ij. Capiat 3 ss. omni nocte.

No. 200. R. Pulv. Jalap. 3 ss. ; Potassæ Bi-tart. 3 ij. ; Pulv. Ipecacuanhæ gr. j. ; tere bene simul, et adde Pulv. Rad. Glycyrrh. 3 ss. ; Syrupi Zingiberis (vel Terebinth. Commun.) 3 ss. M. Fiat Elect., cujus capiat coch. iij. vel ii.

No. 201. R. Potassæ Bi-tart. in Pulv. trit. 3 ss. ; Potassæ Nitratis 3 j. ; Confect. Sennæ 3 ij. ; Syrup. Aurant. q. s. ut fiat Electuarium, cujus capiat coch. j. vel ij. minima; super bibitâ dose mist. seq.

No. 202. R. Magnes. Calcin. 3 j. ; Camphoræ subactæ gr. ij. ; tere et adde Vini Ipecacuanhæ 3 ss. ; Aquæ Mentha Virid. 3 vijæ. ; Syrupi Aurantii 3 ij. Fiat Muc., cujus capiat coch. iij. larga, cum dose Elect. supra scripti.

If castor oil be employed, it will be advisable to exhibit it on the surface of some mucilaginous or emollient vehicle, and to add to it a few drops of laudanum. Whatever may be the purgative prescribed, it should be assisted by emollient and laxative injections, such as F. 144. ; or of tepid water; or fat mutton broth, well strained; or linseed, or sweet, or almond oil. Tenesmus is sometimes aggravated by large enemata. They should, therefore, be of small bulk; or the irritation should be first allayed by an opiate, or an opiate and litharge (see F. 682, 683.), or a belladonna suppository.

84. (c) *Refrigerants* may be exhibited, either alone, or with diaphoretics and diuretics, and with emollient and mucilaginous vehicles (F. 8th) especially after the above means have been employed, and when there are much fever and sense of internal heat. The nitrate of potash may be given with ipecacuanha and opium (F. 642.) ; or with small doses of camphor (F. 36. 460.), or of ipecacuanha (F. 39.); or, in solution with spirit. æther. nit. (F. 436.). liquor ammoniacæ and opiates. The hydrochlorate of ammonia may likewise be exhibited, as in F. 352. and 431.

85. (d) *Opiates, &c.* are productive of the greatest benefit, after depletion; and should be prescribed in large doses. If fecal matters have been carried off, during the diarrhoea often existing in the disease, they ought to be exhibited directly after depletion; and, in all cases, after the operation of a purgative. But much will depend upon the medicines that may be given with them. Of these, ipecacuanha is the most important. From two to four grains of opium with as much ipecacuanha should be prescribed for a dose; and, if not retained, repeated in a short time. These should be taken in the form of pill, which may be washed down by a refrigerant and emollient draught; or the ipecacuanha may be given in a similar vehicle, with from thirty to forty drops of the tinc. opii comp. (F. 729.) ; and repeated according to circumstances. This medicine will ameliorate the symptoms and determine to the cutaneous surface, especially if its action be promoted by the slightly warm bath, or a cupium or hip-bath; and by frictions of the surface subsequently. After a decided effect has been produced by these, Dover's powder may be prescribed at short intervals, so as to keep up its action on the skin; and the abdomen should be swathed in flannel. Opiates may be employed also in the mucilaginous enemata already recommended (F. 143. 147. 152.), and in the form of suppository.

86. (e) *External derivatives and rubefacients* are sometimes of service after depletion and after the above means have been duly employed. A blister may be placed upon the abdomen, but should be removed as soon as it has produced redness, and be followed by warm bread &c.

water poultices. The turpentine epithem will be found still more generally of use, and will not so much increase the irritation experienced in the urinary passages as the blister frequently does. In cases where this symptom is severe, mucilages with soda, nitre, small doses of camphor, and opium, will give relief. When it is urgent, tenesmus is also a prominent feature; the means already advised, especially local depletions, either from the sacrum, or from the perineum, small emollient and cooling injections, and opiate suppositories, being the principal remedies. If the sthenic forms of the disease yield not to the treatment now advised, or if it pass into the chronic state, recourse must be had to such of the methods of cure, and medicines, hereafter to be noticed, as may seem most appropriate to the circumstances of the case. When much debility is complained of, after tormina and tenesmus have been removed by an antiphlogistic treatment, mild bitters, as the infusion of calumba, or infusion of cinchona, with liquor ammoniæ acetatis, tinctura camphoræ compos., and small doses of the vinum ipecacuanhæ, will be productive of much benefit. Costiveness should be carefully guarded against, by the occasional exhibition of a gentle purgative, as directed above (§ 83.), and of aperient and emollient enemata.

87. *Among Europeans in hot climates*, the disease requires a prompt and decided use of antiphlogistic remedies, inasmuch as the inflammatory action is, in these cases, more intense, and arrives more rapidly at an unfavourable termination. The treatment, however, in principle, is the same as that advised above. The good effects of large doses of ipecacuanha and laudanum — from half a drachm to a drachm of each — after bleeding, have been shown by Mr. PLAYFAIR; and of smaller doses — from three to seven or eight, with an equal quantity of some bitter extract — also after requisite depletions, have been found equally beneficial by BALMAIN and TWINING; whilst the impropriety of an indiscriminate use of mercury, especially calomel, in this disease even as it occurs in India, has been acknowledged by these writers, Mr. ANNESLEY, and others. Although dysentery, in persons thus circumstanced, assumes the inflammatory form, or that of *colonitis* (as it has been improperly called by some writers, as the rectum, cæcum, and often the small intestines, are also affected), especially soon after their migration to a hot climate; yet the attendant constitutional affection is not always of a sthenic kind, but frequently assumes either the simple asthenic (§ 25.), or the bilio-adyynamic (§ 28.), or malignant forms; especially in those who have resided long in the country, and where the endemic causes abound. In many cases, also, the symptoms are acutely inflammatory at the commencement, and rapidly pass into a very asthenic state, even before either of the unfavourable changes pointed out above have begun. In such, the antiphlogistic treatment should be early employed, and exhaustion met, as soon as its signs appear, by the remedies about to be recommended for the asthenic varieties. In some instances, also, particularly in persons circumstanced as now stated, the dysenteric affection is entirely symptomatic, either of abscess in the liver, or of interrupted circulation through the ramifications of the vena portæ, — pathological

conditions which should be carefully investigated, as they require very different plans of cure. (See LIVER — *Chronic Inflammation and Suppur.* of.)

88. *B. OF THE ASTHENIC FORMS.* — (a) In the simple asthenic form, ipecacuanha with opium, the warm bath, and gentle purgatives with aperient and emollient enemata, conformably with the views now stated (§ 83.), will frequently remove all disorder. In most instances it will be requisite, and particularly if the biliary secretion be obstructed or vitiated, to give a full dose of calomel (from ten to fifteen grains) with two or three grains of opium, and one of ipecacuanha, a few hours before the purgative is exhibited; and, when dull and constant pain is felt in any part of the abdomen, or tenderness on pressure, a number of leeches should be applied, and be followed by the warm turpentine epithem. Venæsection has been found injurious in this form of dysentery, especially when epidemic during very moist seasons. An ipecacuanha emetic will often be of service at the commencement; but if retching become urgent, opium in the form of pill, sinapisms on the epigastrium, croton oil rubbed on the abdomen; the warm bath, or hip bath, or semicupium; and nitre, with emollients; will both relieve this symptom, and allay the tormina and tenesmus. Mucilaginous mixtures, with paregoric elixir and vinum ipecacuanhæ, are generally serviceable. Emollient clysters and suppositories, with opium, are also requisite. I have seen the preparations of *hop* productive of great relief in this form. They may be prescribed with camphor mixture and liquor ammoniæ acetatis, or with emollients (F. 839, 840. 871.) and diuretics. In the more severe cases, or when the disease does not yield to the above remedies, full doses of camphor, with opium, or with DOVER'S powder, or with the addition of nitre (F. 36. 39.), may be given every five or six hours, and pieces of flannel made warm and moistened with either of the liniments, (F. 297. 307. 311.), be kept upon the abdomen until relief is obtained. Although fecal matters and disordered secretions may have been evacuated before the dysentery symptoms had appeared, yet it will be necessary to have recourse to mild purgatives, from time to time during the progress of the disease, in order to excite the functions of the excreting organs, and to evacuate such morbid secretions as may have collected. The purgatives and aperient enemata recommended above (§ 83.) may be exhibited, or the compound infusion of senna, with an equal quantity of infusion of calumba or gentian, and a little soluble tartar and compound tincture of cardamoms. If the disease be likely to become obstinate, equal quantities of turpentine and castor oil, taken on the surface of milk, or of an aromatic water, and repeated every second or third day, will be most efficacious. After the tormina and tenesmus are removed, mild bitters and tonics; and, in some cases, astringent tonics and absorbents, with the treatment advised in the article DIARRHŒA (§ 29—33.), will generally remove all remaining disorder, if the state of the secretions and of the bowels be duly attended to. If the complaint degenerate into a chronic form; or debility become a prominent feature; and if the excretions indicate, with the state of the surface and tongue, a progressive deterioration of the fluids and soft solids;

the manner above directed (§ 89.), occasionally resorted to. If this variety be characterised by great vital depression, the treatment already directed (§ 91.) must be employed. In all its states, and stages, it will be requisite to evacuate the morbid bile that is secreted, and to correct the diseased action in the liver; but beyond one or two full doses of calomel, either with or without opium, this medicine should not be persisted in; as it increases the irritation of the colon and rectum, and depresses vital energy. The hydrargyrum cum cretâ, as now directed, will be more efficacious; especially when assisted by the above means, and by emollient and mucilaginous diluents.

93. In the *Dark Races*, dysentery assumes the simply asthenic or malignant forms. In them, the treatment may safely be commenced by an ipecacuanha emetic, and followed by a purgative, the warm bath, and warm diaphoretics. Early in the disease, calomel with rhubarb and ginger; or powdered jalap with cream of tartar and some warm spice, will be appropriate; but enemata are also required. The habits and modes of living generally adopted by these races, independently of their more lax fibre, and much less tendency to inflammatory action, require an earlier and more active use of tonics, stimulants, astringents, and aromatic spices, with opium, than can often be safely attempted among Europeans. Purgatives, also, should be of a more stomachic and warm kind, and the functions of the skin especially promoted. The combination of ipecacuanha with tonics, astringents, opiates, and absorbents, according to the peculiarities of the case, is generally extremely efficacious after fecal matters have been evacuated. Camphor, catechu, the hot spices, and warm clothing, with the rest of the tonic and astringent treatment advised for the chronic state, and in *DIARRHOEA* (§ 37.), should be resorted to, as soon as exhaustion supervenes, or when the disease becomes protracted. To Europeans long resident in hot climates, a nearly similar method to that now recommended is applicable, if the hepatic functions be regular; but, as in them the liver is very seldom unaffected, the means directed for the chronic form, which it usually assumes, is more generally appropriate; and the treatment should chiefly depend upon the nature of the primary or attendant hepatic disease.

94. C. TREATMENT OF THE COMPLICATED STATES.

—(a) The association of *acute dysentery* with inflammation of the liver (§ 34.) requires decided and early general or local depletion, or both, followed by cooling purgatives, sufficient merely for the evacuation of morbid secretions. In this complication, the morbid state of the bile, and the rest of the hepatic symptoms, are the consequence of inflammation, and can be removed only by antiphlogistic treatment, and not by inordinate doses of mercury, which will merely over-excite an already excited organ, and accelerate suppuration. Refrigerant, therefore, and cooling aperients, as the bitart. and tartrate of potash, tamarinds, manna, or the potassio-tartrate of soda; antimonial or ipecacuanha diaphoretics; small doses of camphor, with nitre and opium; cooling and emollient enemata, and a very low diet; constitute the principal means of cure. When the patient complains much of burning heat or soreness

in the abdomen, with scalding, &c. in the anus and urethra, the nitrate of potash, with carbonate of soda, and spirit. æther. nit., in emollient vehicles; the hydrochlorate of ammonia in mucilaginous mixtures; suppositories of opium; and local depletions, followed by the warm terebinthinate fomentation over the abdomen; are chiefly to be depended upon. If blisters be applied, they should be surrounded by a number of leeches, the former being removed as soon as they have produced redness, and succeeded by warm poultices. As the substance of the liver is generally more or less acutely inflamed in this complication, and as mercurials will not readily produce their specific effects, or act beneficially, whilst this state continues, but will rather increase it, the exhibition of them with this intention can only occasion abscess, irritative fever, and exhaustion; and furnish one of the most injurious proofs of the "*nimia diligentia*," which is but too common in the treatment of this as well as of hepatic disease. Can any practice be more empirical than to give the same substance to subdue over-excitement, which we find the most active in rousing torpid function, of an organ? Having removed the acute symptoms by the above means, the insertion of one or two setons in either side, and keeping up a free discharge from them for a long time, with appropriate diet and regimen, and change to a healthy air, will generally complete the recovery. When the dysenteric affection is merely *symptomatic of abscess in the liver*, the treatment advised for this condition (see *LIVER — Suppuration of*) should be employed.

95. (b) The complication with disease of the spleen is most common after intermittent and remittent fevers, and in unhealthy localities; and the symptoms are either but little inflammatory or more or less asthenic. Local depletions even are seldom required in its treatment. Warm stomachic aperients, as cinchona with rhubarb, ipecacuanha, and aromatics; emollient enemata with anodynes; the warm bath, followed by frictions of the abdomen with either of the liniments, F. 297. 311., upon coming out of it; ipecacuanha with strychnia or sulphate of quinine, or sulphate of iron, or with tonic extracts; camphor with warm diaphoretics, and the medicines directed for the more chronic states, which it more frequently assumes, or passes into; are the most appropriate in this state of the complaint. When dysentery follows *continued or periodic fever*, disease of the liver or spleen, or of both, should be dreaded, as well as its rapid termination in ulceration; and means, conformably with what has now been advanced, should accordingly be promptly put in practice. The most efficacious of these, are early local depletions—but only when the symptoms clearly indicate the propriety of resorting to them; the terebinthinate epithem applied to the abdomen, or large blisters, followed by poultices, and repeated according to the urgency of the case; with the rest of the treatment directed for the asthenic states, according to the peculiarities of the case.

96. (c) The association of *acute dysentery* with scurvy, requires the removal of the exciting causes; a suitable diet, especially fresh meat and vegetables; the liberal use of lime juice, with sugar, mucilage, and opium; the bi-carbonate of potash or soda in effervescence, with an excess of lime juice, particularly when the secretions re-

purgatives, aided by laxative clysters, will be required, and should be repeated until the collection is evacuated.

100. ii. TREATMENT OF THE SUB-ACUTE AND CHRONIC FORMS. — *A. Of the more simple states.* — The intentions of cure by which we are guided in the acute, should, with little modification, be entertained in the chronic, forms. When the symptoms continuing after an acute attack consist chiefly of either frequent or copious evacuations, without tormina or straining, the appetite, pulse, and strength improving, or remaining unimpaired, astringents or opiates should not be prescribed; for the discharges are the means of bringing about a resolution of the inflamed and tumefied viscera. In such cases, the stools are usually of a good colour, and are feculent and fluid. But, if the motions be attended by abdominal soreness, increased on pressure; or by a sense of heat; or by griping, tormina, or tenesmus; if they be slimy, or sanguineous; and if the patient complain of thirst, with fever and restlessness at night; nature requires the judicious assistance of art. Here vascular depletion, most frequently local, although it may have already been practised, and more especially if it have not been resorted to, is required to an extent which the constitutional symptoms will indicate. If, however, the strength is too far sunk, or the asthenic characters are too prominent to admit of this measure, the warm epithem already described (§ 89.), or blisters to the abdomen, followed by a succession of poultices, and these by the warm bath, a thick flannel bandage around the abdomen, and stimulating frictions of the surface, and of the lower limbs, will sometimes be serviceable.

101. In all cases, the state of the biliary secretion and of the liver should be carefully examined. If the investigation furnish no proof of acute disease, or of abscess of this viscus, and if the bile be scanty or altogether obstructed, camphorated mercurial frictions on the hypochondrium, blue pill or hydrargyrum cum cretâ, with ipecacuanha or Dover's powder at bedtime, and a mild purgative, such as cream of tartar, with confection of senna and extract of taraxacum in the form of electuary, in the morning, will often increase and improve the bile. If mercurials have not been previously used, and if no tenderness or soreness be felt in the region of the liver, nor oppression of breathing, dry cough, nor recurring chills or horripilations alternating with hectic flushings, &c., one or two full doses of calomel, with or without opium, may precede these medicines; the operation of which may be assisted, and the state of the large bowels improved, by emollient and oleaginous injections. After these means have been tried without benefit, the emplastrum ammoniaci cum hydrargyro may be placed over the abdomen; and one or two grains of hydrarg. cum cretâ, or of blue pill, with one of ipecacuanha, and as much camphor, taken thrice daily, with a draught containing a drachm of the extract of taraxacum, or consisting of the decoction of the recent root. As long as the stools are deficient in bile, astringent tonics will seldom prove permanently serviceable; but if the above medicines run off too rapidly in the stools, the compound tincture of opium should be added to them.

102. When the foregoing means have failed, nitric acid with opium or laudanum; and the ap-

plication of the *nitro-hydrochloric acid* lotion over the hypochondria and abdomen, may be tried; or, instead of the nitric, the nitro-hydrochloric acid may be taken internally, in a very weak state of solution, or employed as an enema, with the laudanum, F. 729. Enemata consisting of a weak infusion of ipecacuanha, or of the decoctum lini, with mucilage, or of both, may be administered once or twice a day, while the acids are taken. If these fail, and if the debility be great, the *chlorates*, especially those of potassa or lime, may be given by the mouth, or in clysters.

103. In the advanced stages, the infusion of cinchona, of cinchona and rhubarb, either with or without laudanum, or of catechu with aromatics and warm spices, are generally requisite, more especially in the dark races; the same preparations being also advantageously administered as enemata, either with or without mucilaginous substances. When the disease, like a gleet discharge, proceeds from relaxation of the internal surface of the large bowels, and a habit of increased secretion, these means will prove of essential service. In many cases, the disorder is kept up either by too great indulgence in food, or by the use of stimulating liquors. The diet should, therefore, be restricted; and the digestion of what is taken promoted either by the above medicines, or by the sulphate of quinine or the sulphate of zinc in the form of pill, with inspissated ox-gall, or other medicines suited to the case. If we succeed in controlling the increased action of the bowels, an opposite state should be carefully guarded against, by the occasional exhibition of the means directed above (§ 83.); or of the draught and enema already mentioned (§ 90.). Inattention to this precaution, and errors in diet and regimen, are frequently productive of relapses.

104. If diarrhoea continue after the acute symptoms longer than seems sufficient for the resolution of inflammatory action in the large bowels, and of congestion of the portal vessels, we may suspect that the quantity or kind of aliment is such as the digestive organs, and the biliary and other secretions, are incapable of changing into healthy chyle,—a large proportion of it entering into such acid or acrid combinations as its constituents dispose it to form. In these cases, the stools are frothy, have a sour odour, or are lienteric; and tonics, with mild mercurials and antacids; the sulphate of quinine, as above recommended; the balsams with magnesia, and the liquor potassæ, or the sesqui-carbonate of ammonia, with tonic infusions, aromatics, and small doses of SYDENHAM'S laudanum (F. 729.); are required; whilst the abdomen and hypochondria are sponged with the nitro-hydrochloric solution; and the large bowels fortified by the tonic and mucilaginous injections already mentioned.

105. In the cases denominated "*White flux*," from the muco-purulent and gleet appearance of the discharge from the muciparous glands, and the absence of bile, a similar treatment to the above is required; with an occasional dose of calomel, or frequent and small doses of the mildest mercurials, as above directed (§ 101.). The infusion of either cusparia, catechu, simarouba, calumba, rhubarb, cinnamon, &c., with vinum ipecacuanhæ, aromatics, absorbents, and astringents, according to circumstances; the chlorates, or nitre with soda and emollients, in aro-

matic vehicles, and in clysters; assafoetida, with camphor and mucilage, in enemata; and the daily use of the salt-water warm bath, followed by frictions of the surface with a rubefacient and deobstruent liniment (F. 311.), and a flannel roller around the abdomen; may also be resorted to.

106. If the evacuations indicate *ulceration* (§ 54.) — which, indeed, is seldom altogether wanting in protracted cases — the above treatment, or mucilaginous mixtures with either of the balsams; emollient clysters, and the repeated applications of large blisters, or rubefacients, to the abdomen, or the insertion of setons, are chiefly to be relied on, with the other means advised in the treatment of *DIARRHŒA* (§ 32.), arising from this pathological state.

107. A form of chronic dysentery depends upon, or is kept up by, *ulceration*, or even by a single large ulcer, in the *rectum*, with or without *prolapsus ani* (§ 47.), the abdominal symptoms being slight, but the tenesmus constant and painful. For it, small injections of a solution of the sulphate of zinc, or nitrate of silver, or dilute nitric acid with opium, or acetate of lead, with pyroligneous acid and laudanum; or of paregoric elixir with mucilage; or of simple camphor mixture; the balsams, or sulphur with cream of tartar, and tonics with deobstruents, being taken internally, and a gently open state of the bowels preserved; will remove the disorder. In nearly all the more simple states of chronic dysentery, also, the same treatment may be appropriately employed as is recommended in the chronic states of *diarrhœa*, *lientery*, &c. (See *DIARRHŒA*, § 29 — 33. and § 41. *et seq.*)

108. *B. The complications of chronic dysentery* are much more common than the simple states; and the most frequent are those with chronic affections of the liver, with disease of the mesenteric glands, and with enlargement of the pancreas and spleen. — (a) If the *liver* be free from acute disease of its substance, or from purulent formations (see *LIVER — Inflam. and Suppurat. of*), mercurials are often essentially requisite. But, even in such cases, they have been much too liberally employed, on the supposition that salivation is indispensable to the cure of this complication. Where, however, these forms of hepatic disease exist, they should almost altogether be proscribed; and also, where the powers of the system are much reduced, even in the simple states of the disease, the extension of inflammatory irritation to the mesenteric and portal veins, or the absorption of morbid matters from the bowels (§ 77.), and consequent disease — especially purulent collections — in the liver, may be favoured or induced by prescribing them so as to produce their specific effects.

109. (a) We often have little or no proof of the presence of chronic change in the liver, beyond the torpid state of its functions already noticed (§ 48.), viewed in connection with the habits of the patient, and the history of his former complaints, and of his present attack; but, in these, mild mercurials, in frequent and small quantities, in conjunction with alteratives and deobstruents (§ 101.), especially minute quantities of antimony, with ammoniacum, soap, and opium; or these with taraxacum in full doses; or this latter with the infusion of calumba; will be found the safest as well as the most efficacious remedies, parti-

cularly when assisted by a camphorated mercurial ointment or liniment applied over the hypochondria; or by the nitro-hydrochloric acid solution, employed either as a wash, a lotion, or on the surface of warm poultices; or by repeated blisters; or by issues or setons, and the ammoniacal and mercurial plaster over the abdomen, or a combination of it with other deobstruent and warm plasters. In these cases, we must be guided by the evidence we may have of change of the liver, and direct our treatment to its removal, conformably with the views stated in the article on the diseases of that viscus. When the stools are frothy, and deficient in bile, the hydrargyrum cum cretâ, or the blue pill, will be advantageously combined with inspissated ox-gall, extract of taraxacum, and small doses of Dover's powder, or opium. The carbonates of the alkalies, or bicarbonate of soda, may also be given with vegetable tincture, ipecacuanha, and the preparations of hop; either of the liniments (F. 296. 311.), alone, or with the mercurial liniment, being daily rubbed upon the abdomen, or applied by means of a piece of flannel moistened with it and placed under wrather, — which will protect the clothes from it, and prevent its evaporation. In the foregoing states of hepatic complication, change of air, horse exercise, or travelling, and a regulated diet and regimen, will materially assist the treatment.

110. *β.* A sub-acute, slight, or chronic form of dysentery is sometimes merely symptomatic of the advanced states of hepatic abscess, and occurs more frequently than the very acute complication alluded to above (§ 94.). It requires either a similar treatment to that now stated, or simply support of the powers of life, in order to enable them to overcome the disease. The arrest of the discharge in this state of the complaint frequently increases the hepatic malady, or occasions severe constitutional disturbance. Gentle tonics and restoratives, light or farinaceous food, and such astringents, anodynes, and emollients as will merely control and soothe the bowel affection, until the above treatment, or that recommended for *suppuration of the liver*, shall remove the principal or primary disease, are the most deserving of confidence.

111. *γ.* When purulent matter collects in the liver, in an advanced stage of dysentery, the occurrence can be explained only as attempted above (§ 77.); and, during the life of the patient, the symptoms will seldom warrant more than a supposition of its having taken place. The facts, that a bad habit of body, and an asthenic state of the powers of life, are the chief causes of the absorption into the blood of morbid matters from the seat of disease, and of the extension of inflammation from an ulcerated part along the veins; and that these changes induce those observed in the liver in such cases, should be kept in view in the treatment of the advanced stages of dysentery, — particularly as it has been satisfactorily shown that a large proportion of unfavourable cases terminate fatally, owing to the contamination of the circulating fluid produced in this manner, either with or without the concomitant lesions of the liver, of which particular notice has been taken. Conformably, therefore, with these facts, the remedies I have shown, in the article *VIRUS*, to be most efficacious in arresting the extension of inflammation along them, in preventing or counteracting the contamination of the blood, and in supporting the vital

much service either with or without opium, especially in the asthenic states, and as they occur in the dark races. GOEDEN (in HORN's *Archiv. Mart.* 1812, p. 284. and 323.) prescribes *tartaric acid* with refrigerants, and opium; BANG, *sulphuric acid* with mucilage; ANNESLEY, the *nitro-hydrochloric acids*, with anodynes; and M'GARROD and HOPE, *nitric acid* with opium; this last being chiefly appropriate to chronic cases, and those associated with disease of the collatitious viscera. BIRNSTIEL directs *alum* conjoined with camphor; LOOS (HORN's *Archiv.* Jan. 1810, p. 193.) *alum* with *tormentilla root*; HUNNIUS, MICHAËLIS (HUFELAND, *Journ. der Pr. Arzneyk.* b. vi. p. 280.), and HARGENS (*Ibid.* b. vii. p. 137.), *alum* with mucilages, opium, &c., chiefly in the chronic and atonic states; MOSELEY and JACKSON, *alum* with sulphate of zinc, by the mouth and injections; and ADAIR, *alum* with spermaceti, or gum, opium, and aromatics, in epidemic dysentery occurring among negroes. *Lime water* with milk, or with mucilages, is praised by GRAINGER, BREFELD, and LANGE; but is most serviceable in the chronic and asthenic states, and in the form of enema; in which cases, various other astringents are recommended, especially after morbid matters are evacuated. In this manner the preparations of *catechu* are directed by BRANDE (TODE's *Med. Journ.* b. x. n. l.) and others; *kino*, by WEBER; the infusion of *galls* with opium, by ELLIOTSON and ROOTS; *hæmatorylon* with cinnamon and other aromatics, by PRINGLE and WENDT; the *tormentilla root*, by HOFFMANN; the *lythrum salicaria*, by QUARIN and GARDANE; the root of the *ledum palustre*, by BIORN LUND; *betel*, by PERON; the inner bark of the *brucea antidysenterica*, by several writers; and the decoction of the *pomegranate bark*, or of the rind of the fruit, by the ancients, and by many modern authors. All these, especially *tormentilla*, *catechu*, and *betel*, are advantageously combined with *ipécacuanha* or DOVER's powder. Several mineral astringents are also exhibited, especially in the asthenic and chronic states, or in far advanced stages; internally as well as in enemata. *Arsenic*, and the rust of *copper*, are prescribed by GALEN, RHazes, and most of the ancients; and the *sulphates of zinc*, of *copper*, and of *iron*; and the *nitrate of silver*, either with or without opium; by the authorities referred to in the article DIARRHŒA (§ 50.). The *acetate of lead* is recommended by FERNELIUS, CAMERARIUS, and NARDIUS, and is now frequently employed, in pills, draughts, or injections, generally with opium and *ipécacuanha*, both in the acute and chronic forms; particularly the latter. It should be recollected, when prescribing astringents in this disease, that they are injurious when exhibited early in the acute states, and whilst there is much fever, or when morbid matters remain to be evacuated. In other circumstances, they frequently are of much service; particularly when altered secretions and accumulated excretions are discharged from time to time by a judicious exhibition of mild purgatives; and when they are conjoined with demulcents, with *ipécacuanha*, or with absorbents, or with anodynes, according to the forms of the disease and the state of the patient. MORTON found them injurious, although they diminished the discharges; in the malignant or colliquative epidemic of 1666; and similar results have been remarked by others.

131. *H. Tonics* are required in nearly the same states of the disease as astringents; but they are less frequently injurious, as they do not so completely suppress the discharge from the intestinal mucous surface as astringents usually do. They admit, also, of similar combinations with anodynes, demulcents, and absorbents, to those found most serviceable with astringents; and possess the additional advantage of promoting the operation, and, in some instances, counteracting the ill consequences that might result from the exhibition of purgatives or aperients. In the asthenic form, they may be exhibited as early as the morbid matters are evacuated, particularly in conjunction with *ipécacuanha*, or diaphoretics and opium, and when evacuation should be promoted, they are beneficially associated with laxatives. *Cinchona* is praised by WHYT, LINER, CLARE, and DOUGLAS (*De Dysent. Putrida*, ed. 1766, p. 31). BANG prescribes it with rhubarb (*Act. Reg. N. Med. Haun.* vol. i. p. 105.); SCHMIDTMANN, with *ipécacuanha*; WHYT, QUARIN, and PRINGLE, with *catechu* and *ipécacuanha*, after bleeding and alvine evacuation; and MORTON with opium. HEUERMANN restricts it to dysentery following fevers; and CULLEN advises it chiefly when the disease assumes an intermitting or remitting character. HUXHAM and PRINGLE prescribed an infusion of it and *serpentaria*, with great benefit, in the asthenic and malignant states, and during convalescence. MARCUS considers the bark injurious; which it doubtless is in the early stage of the inflammatory forms. Most of the other tonics are recommended by authors, and admit of similar forms of exhibition, in the states which require the lighter preparations of bark; for where the infusion or decoction of *cinchona*, with *lysammonis acetatis*, *vinum ipécacuanhae*, and anodynes, are of service, the other tonic infusions will also be of use. Indeed, some of them, as the infusion of *calumba* (PERCIVAL and MARTIN) or of the *cusparia bark* (BRANDE, in *Hannover Magaz.* b. xxviii. p. 1101.), will be preferred in certain forms of the disease, especially in the combination now stated. In the advanced stages of the acute, or in the chronic and morbid asthenic forms, where tonics are chiefly required, *simarouba* (WRIGHT, GOUGH, WENDT, QUARIN, BAUMES, DEONER, and SUMERK) will be found an excellent remedy, either alone, or with the medicines just enumerated. Dr. O'BRIEN found it very serviceable in the advanced stage of the dysentery that was lately epidemic in Ireland, in conjunction with opium. The *cinchona bark* (LOEFFLER and OSIANDER), and *camphor* (WEBER, and HORN, *Archiv.* July, 1820, p. 311) may be employed in similar circumstances, and in the same combinations. It should be overlooked, that tonics ought to be prevented by vascular depletions, or alvine evacuations where either is required; that the promotion of the latter, by suitable laxatives conjoined with, or intervening between them, or exhibited in enemata, will occasionally be required, especially when the disease proceeds from a morbid state of the secretions; and that they should be very cautiously resorted to in the atonic or phlogistic varieties, even in their advanced stages.

132. *I. Aromatics and Absorbents* are useful adjuvants in the advanced periods, or acute

to employ it in this manner, in conjunction with large doses of laudanum. A few years afterwards, Mr. PLAYFAIR adopted this practice in India; he giving from half a drachm to a drachm, with as much laudanum, and directing this dose to be repeated again and again if it should be rejected. Mr. ENGLISH prescribed from a scruple to half a drachm, with double this quantity of laudanum; and Dr. BATEMAN confirmed the propriety of this method in all the stages and forms of the disease, as he has observed it in this country. More recently, Mr. TWINING has modified this practice, and directed from four to eight — more frequently six — grains of ipecacuanha, with nearly as much extract of gentian, and occasionally also with blue pill or calomel, twice or thrice daily; premising bleeding and alvine evacuations in the acute disease, and resorting to mild purgatives once a day, during the treatment. I had, in 1817 and 1818, given from eight to ten grains of ipecacuanha with opium, and sometimes also with calomel or blue pill, with the best results; having at first, by mistake, prescribed the simple powder for the compound; and afterwards continued the practice when the circumstance and the effects became known to me. FISCHER directs ipecacuanha when opiates fail of affording relief. RHANOÏ (*Act. Reg. Soc. Haun.* vol. i. p. 33.) combines it with rhubarb; and CLARKE, SCHLEGEL, and ANNESLEY give it in the form of infusion, which may also be exhibited as an enema. Dr. DICK praises it in the dysentery of India; the bowels being freely opened by clysters, whilst it is frequently given by the mouth. It may be conjoined with nearly every other medicine that can be exhibited in this disease — with refrigerants and evacuants in the inflammatory states, and with tonics and antiseptics in the malignant; and it will occasion as much nausea in one or two grains, as in sixty; this effect being less remarkable after its exhibition in the form of pill, and with bitters or opium, or even with calomel, than when taken in simple powder.

135. *M. Rhubarb* may be given either as a mild purgative, or as a gentle astringent. It is approved of by BORELLUS (*Cent.* ii. obs. 82.) HEISTER, RIEDLIN, PRINGLE, JACOBS, and BAKER; is considered injurious by KORTUM, JAWANDT, WEBER, NEUMANN and MURSINNA, and is prescribed only in the most advanced stage by LIND, STOLL, and RICHTER. It is

variation with a Mr. WENTWORTH, who assisted me, I formed the design of giving it in larger quantities. He informed me, that a man, who lived in the same town where he did, was uncommonly successful in the cure of dysentery, by using from a drachm and a half to two drachms of ipecacuanha, with laudanum. Mr. W. had just previously to this conversation, given ninety grains of the powder, with forty drops of tinct. opii, to a man whose life was apparently near a close, and with whom evacuants had been used. There was a wonderful abatement of every symptom in the course of one night; and a repetition of the medicine in smaller quantities, completed the cure in a few days. I did not hesitate to follow this practice; and gave the ipecacuanha frequently to the quantity of two drachms, with the addition of sixty drops of tinct. opii: and, in many cases, found that a dose or two was sufficient to remove every dangerous symptom. It answered the purpose best when given in the form of pills; and if the patient kept still, and lay on his back, with the head and chest tolerably elevated, nausea seldom or ever followed it; and oftentimes it happened that he had not a stool the succeeding day, although, previously, the gripings were violent, and the discharges of blood frequent and in large quantities." (*Mem. of Med. Soc. of Lond.* vol. v. p. 210.)

much praised by PRINGLE, in the camp dysentery, especially when exhibited in large doses as emetics; and it is often of much service in the dysentery of children, conjoined with hydragrum cum creta, and minute doses of ipecacuanha, or with absorbents and Dover's powder. It is one of the best purgatives in the more asthenic forms; but it is injurious in the early stages of the inflammatory disease, or when the bile is obstructed; and it then often increases the tenesmus, as remarked by WENDELSTADT and myself. It is apt, in many constitutions, to suppress the excretion of bile, even although it may operate on the bowels; and, upon the whole, it requires much discrimination in its use.

136. *N. Camphor* is favourably noticed by BREFFELD, MARCUS, SPONIZER (*Hufeland, Journ. der Pr. Heilk.* b. v. p. 546.), and MENDEL (*Ann. Aug.* 1810, p. 88.). CHAMBERLAIN directs it to be dissolved in oil; MICHAËLIS conjoins it with opium; and OSIANDER and THOMANN (*Ann. 1800*, p. 258.) employ it freely, both internally and externally. It is an excellent adjunct in small doses, to refrigerants or diaphoretics, in the inflammatory or acute states; and, in large doses, with other antiseptics or tonics, in the malignant variety, and in the verminous and rheumatic complications. It is particularly serviceable in the nervous or typhoid state; and in the advanced stage, when nervous symptoms pervene. It may be given with ipecacuanha either in pills, or in demulcents; and in enemas. In the infectious conditions, it should seldom be omitted; and may in these, especially such as are malignant, be given in doses of six or twelve grains.

137. *O. The terebinthines* are valuable remedies in the asthenic and chronic forms. They were recommended by the author (*Med. & Phys. Journ.* vol. xvi. p. 107.), and have been employed by several physicians. The circumstances in which they may be resorted to, in the manner of prescribing them, are manifest from what has been stated. They are not contraindicated in the inflammatory varieties, although bleeding should be premised; and, when exhibited so as to act gently on the bowels, or in small enemata, they counteract the tendency to sloughing or ulceration; particularly in the asthenic varieties. Any of the balsams — but particularly the Peruvian (F. 843.), Canada, and copaiba — may be given with aromatic magnesia, and demulcents; or with opiates; and administered in enemata. They are most serviceable in the chronic diseases, especially when assisted by frictions of the surface, decoctions, plasters, flannel bandages, and regulated diet. When the stools are frequent, and without pain, they are particularly serviceable, the hydragrum cum creta being taken with Dover's powder at night; or they may be alternated with either the hæmatoxylon, catechu, or kino, in mucilaginous or absorbent vehicles.

138. *P. Antiseptics* are praised by WISEMAN. With a view to its antiseptic as well as to its astringent operation, JACKSON and CRAWFORD recommend the use of charcoal, in doses of half a drachm to a drachm, frequently repeated. It may be advantageously given rubbed up with camphor. But the chlorates are much more powerful agents. The chlorate of potash is prescribed by GABRIEL.

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DYSMENORRŒA. See MENSTRUATION.

DYSPHAGIA. See DEGLUTITION, DIFFICULT.

DYSPNŒA. See RESPIRATION, &c.

DYSURIA. See URINE, &c.

EAR—NERVOUS AFFECTIONS OF THE.

1. *Certain diseases of the ear will be here considered; which, although sometimes attended by disorder of hearing; and often terminating in impairment, or loss of this sense; are not necessarily accompanied by either.*—In the article *HEARING*, the affections of this function will be viewed with reference to the lesions producing them, seated in different parts of the organ.

I. NOISES IN THE EAR. SYN.—*Tinnitus, Susurrus, Sonitus, Sibilus, Syrigmus, Bombus, Aurium,*

Auct. Paracensis illusoria, Good. *Das Ohrentönen, Ohrenklingen*, Ger. *Tintement, Bourdonnement de l'Oreille*, Fr. *Singing in the Ear*.

CLASSIF.—4. Class, 2. Order (Good.)—I. CLASS, IV. ORDER (Author).

2. DEFIN.—*A sense of ringing, whissing, or beating sounds in one or both ears, without external causes.*

3. i. *These sounds vary in their characters. They are sometimes sharp, shrill, ringing, and successive; occasionally whizzing, roaring, acute, and continuous; and in other instances, beating or throbbing. They may be recurrent or intermittent, or devoid even of remissions, and be heard either in one or in both ears. M. ITARD—the highest authority on diseases of the ear—divides them into,—1st, The false, or those which have no existence whatever; and, 2d, the true, or such as are seated in the interior of the head, or of the ear, but without being caused by external sonorous bodies. Tinnitus aurium is most frequently attended by a slight degree of deafness, which, in some cases, it produces, and in others is merely coincident with it. (a) True tinnitus may proceed from—α. cerebral plethora, congestion, or determination;—β. the impeded or obstructed return of blood from parts within the head;—and, γ. mechanical obstacle to the free circulation of air in the different compartments of the ear; but without completely preventing its entrance, for then the noise would be replaced by simple deafness. When the noises depend upon the state of the cerebral circulation, they are generally beating, heavy, hissing, or whizzing; frequently correspond with the pulsation of the carotids, which also is often strong; and are arrested by pressure of these vessels. (b) False tinnitus is—α. idiopathic, as when a very loud noise has injured the functions of the auditory nerve; and, β. symptomatic, when allied to some nervous affection, often unappreciable in respect either of its cause or of its nature, or sympathetic of disorders of some other organs. Thus, this affection often attends indigestion, and hypochondriasis, especially in persons devoted to prolonged and exhausting mental exertions; sometimes debility or hysteria, particularly in delicate females, who have suffered from excessive discharges, or who are addicted to venereal indulgences or masturbatio; and occasionally disorders of the prima via, as worms, torpid states of the colon, &c. In this variety, the noises are, in some cases, of a very unusual and even singular kind; and in hypochondriacal, nervous, or melancholic persons, give rise to various fancies or even hallucinations. In the case of a lady, for whom I was lately consulted at the same time with two other physicians, and who complained of noises in the ears after having suffered in her general health from too frequent returns of the catamenia, in excessive quantity, there gradually arose in the mind of the patient, an idea that persons were engaged whispering behind her; and ultimately it took so firm a possession of her mind, that it amounted to an hallucination, influencing both her judgment and her actions.*

4. ii. *Noises in the ears are most frequently caused by interruption to the free circulation of air through the Eustachian tube. Hence they are common attendants on catarrhs, and on enlargement of the glands, &c. in the vicinity of the tube;*

taçée, Furoncle Atonique, Fr. Erbsenblattern, Eiternde Flechte, Germ. Papulous Scall.

CLASSIF. — 5. Order, Pustular Eruptions (Willan). 6. Class, Dis. of Excrerent Functions; 3. Order, Affecting the Skin (Good). III. CLASS, I. ORDER (Author in Preface).

1. DEFIN. — An eruption of large, round, and distinct pustules, seated on a hard, elevated, red base, and terminating in a thick, hard, and dark-coloured scab, leaving a livid spot or superficial cicatrix; not contagious.

2. I. DESCRIPTION. — These pustules are always discrete, scattered sparingly, and appear successively in different parts of the body; and rarely terminate in ulceration or tuberculous induration. They may appear in any part of the body; but they are most frequently observed on the limbs, abdomen, shoulders, breast, and neck — rarely in the face or scalp. They present modified states, according to the causes, the age of the patient, and the severity of the eruption. These WILLAN has arranged into *Ecthyma Vulgare, E. Infantilis, E. luridum*, and *E. Cachecticum*. To these may be added the *Ecthyma Syphiliticum* (FRANK, BIETT, CAZENAVE, SCHEDEL, TODD, &c.), the syphilitic affection sometimes assuming the ecthymatous form. M. RAYER has adopted a simpler and more correct division, viz. into the *Acute* and *Chronic*, which I shall here follow.

3. i. ACUTE ECTHYMA; *E. Vulgare*, WILLAN. — In its simpler and rarer form, ecthyma appears in some one part of the body, most frequently on the neck and shoulders, in the form of circumscribed reddish elevations, firm to the touch, and distant from each other. Pus soon is formed at the summit of these elevations; and the pustules are completely developed in three or four days; their basis being much inflamed, elevated, large, hard, and circular, — of a bright red in young persons, and of a livid red in the aged. Their suppurating summits generally break in one or two days after their formation; the purulent matter giving rise to a brownish or greenish, and very adherent scab. After one or two weeks, the scabs are detached, and leave a livid red mark, or occasionally very superficial cicatrices, of the size of those of small-pox, but much less deep. The eruption of the pustules is attended with stinging pains in them; sometimes with tumefaction of the adjoining lymphatic glands, and is often preceded or accompanied by chronic inflammation of the digestive mucous surface, which may continue after the healing of the pustules. This variety is seldom attended by fever.

4. ii. CHRONIC ECTHYMA is much more frequent than the preceding, and always consists of several successive eruptions on the limbs, neck, breast, &c., at periods more or less distant. The pustules present the same characters, and follow individually and independently of each other, the same course as above described; some making their appearance whilst others are suppurating, or even healing. During several months, divers eruptions are thus formed. Besides the successive eruptions, the pustules themselves may be more chronic, their bases assuming large dimensions, approaching those of boils, and being tense and prominent. In these cases, the subjacent cellular tissue is inflamed, their areolæ becoming hard and violet-coloured. — *Ecthyma luridum* of WILLAN.

Their summits break in eight or ten days, and discharge a little sanious or bloody matter, sometimes ulcerate slightly, and are covered by hard and black crusts or scabs, which adhere firmly, and are surrounded by livid red areolæ, which sometimes remain after the crusts have fallen off; this taking place in the course of a few weeks; leaving dark red spots, or livid cicatrices, after them. If the scabs are torn away before the period at which they usually fall off, small indolent ulcers, with callous borders, giving issue to a sanious fluid, are often produced. When the pustules remain long stationary without ulcerating, they are occasionally followed by violet-coloured tubercles, which may ultimately suppurate or ulcerate, and more deeply mark the skin. A symptomatic form of this eruption, which is often tedious and severe, sometimes attends the cachexia consequent on measles and other eruptive fevers; but it differs in nothing from the disease now described, excepting in the number of the pustules, and the marked constitutional disorder.

5. The successive eruptions characterising this variety are observed chiefly in feeble and ill fed children — (*Ecthyma Infantile* of WILLAN). — When the number of pustules is small, and the successive eruptions are distant from each other, there is generally little or no fever. But when the pustules are numerous, their bases very large and much inflamed, or if they ulcerate, there is usually present a co-ordinate degree of fever — *Ecthyma Febrile, E. Cachecticum*. — The febrile symptoms sometimes precede, and at other times accompany the severer forms of the eruption, particularly in unhealthy and aged persons; and are also attended by gastric and intestinal disorder, — by anorexia, pain at the epigastrium, irregularity or constipation of the bowels, a morbid appearance of the tongue, gums, and fauces, and of the evacuations, headach, pains in the limbs, lassitude, and by great depression of spirits, — with heat, stinging, tingling, or itching in the pustules. In such cases, as well as in other chronic states, this eruption is often complicated with swellings of the lymphatic glands, with inflammation of the conjunctiva, or of the fauces, or of the pharynx; with œdema of the lower extremities; and with other cutaneous eruptions, especially with *rupia* and *furunculus*. It is also frequently associated with, or rather symptomatic of, chronic inflammation of the digestive or respiratory mucous surfaces and biliary derangement. The duration of chronic ecthyma is always subordinate to the successive eruptions of pustules, to the habit and constitution of the patient, and the treatment employed. It is usually from two to four months; but it may be longer or shorter.

6. When syphilitic disease gives rise to eruptions with the characters of ecthyma — *E. Syphiliticum; Psudracia Venerea*, J. FRANK; *Syphilide pustuleuse, Phlyzacie*, BIETT, RAYER, &c.; *Pustular Venereal Disease*, CARMICHAEL — the pustules are always surrounded by broad, dark, copper-coloured areolæ, and are very large, indolent, and inclined to ulcerate. The ulcerations, when the scabs are detached, are deep, greyish or pale, unhealthy, with abrupt and violet-coloured edges; but they seldom extend, the scabs gradually reforming over them, and being successively detached, until they heal under appropriate treatment, leaving permanent,

always suspect disorder of the digestive and assimilating functions; and if there be little or no fever, have recourse to deobstruent alteratives, as PLUMMER'S pill, with soap, or taraxacum, at night; a stomachic purgative every second or third morning, and the decoction of sarsaparilla; or mild tonic infusions with soda or potash, in the course of the day. If we suspect congestion of the liver, or find tenderness of the stomach on pressure, small local depletions should be employed, and repeated according to circumstances, whilst the above depurating and mildly tonic remedies are continued. Mercurials should not be given in large doses. PLUMMER'S pill, blue pill, or hydrarg. cum creta, with taraxacum, inspissated ox-gall, guaiacum, and sarsaparilla, are the most beneficial. The occasional exhibition of purgatives, or the association of them with tonics, is also necessary, especially if the stools be morbid, and the abdominal viscera require to be excited. In such cases, a prolonged course of tonic or stomachic purgatives is often necessary.

12. c. When the cachectic state is complicated with some degree of febrile action (§ 5.), the mild mercurials now particularised should be conjoined with James's or Dover's powder; and saline diaphoretics exhibited at short intervals; the morbid secretions and faecal accumulations being evacuated from time to time, by cooling purgatives. If there be tenderness at the epigastrium, a few leeches applied there will materially assist these remedies. After these, the infusion or decoction of cinchona with liquor ammoniæ acetatis, or with the pyroligneous acid, or with nitrate of potash and carbonate of soda; a course of tonic infusions, with alkalies and the extract of taraxacum; tepid or warm bathing; the mineral acids with anodynes; and the other means particularised in the last paragraph; may severally be exhibited. Having removed fever, and evacuated morbid matters, more active tonics, as the quinine in the compound infusion of roses, with tinctura opii; the decoctum cinchonæ with the mineral acids, or with camphor and ammonia; chalybeate preparations, sarsaparilla and guaiacum, the balsams and terebinthines with magnesia, common tar made into pills with this absorbent, the bark of the *madar* root, &c., may be prescribed.

13. d. The syphilitic form of ecthyma should be treated in the manner described in the article ACNE (§ 30.). MR. CARMICHAEL does not consider this eruption as being truly syphilitic, and therefore confides chiefly in sarsaparilla with antimonials and guaiacum. In a case of this form of syphilitic eruption, lately attended by my friend MR. C. HUTCHINSON and myself, bichloride of mercury, given in sarsaparilla, was required for its cure, milder means not having succeeded. DR. A. T. THOMSON advises this preparation in minute doses to be given in the decoction of elm-bark, or in the emulsion of bitter almonds. In the cases of infants, some French physicians recommend the milk of a goat on which mercurial ointment has been rubbed. When the child is at the breast, the nurse should enter upon a gentle course of the bichloride in the decoction of sarsaparilla, or in almond emulsion.

14. e. External means are sometimes required to remove the irritation attending the eruption, and to heal such as ulcerate. With these inten-

tions, tepid alkaline baths; fomentations with a decoction of poppy-heads; a weak solution of the chlorinated lime or soda, especially when there is ulceration; or solutions of chlorine, or of sulphate of zinc with hydrocyanic acid, or of the nitro-hydrochloric acids, or of nitrate of silver, &c.; may severally be employed. DR. A. T. THOMSON recommends the following:—

No. 209. R. Plumbi Acetatis 3 ss.; Acidi Hydrocyanici 3 iij.; Unguenti Cetacel 3 iij. M. Fiat Unguentum partibus cutis nudis applicandum.

15. f. The diet in the acute form ought to be bland and farinaceous, whey and emollient fluids, or water with a little vinegar, being the chief beverages.—In the chronic states, light and nourishing food, if there be no fever, or after fever is removed, is always requisite. In the more cachectic cases, a small quantity of wine should also be allowed. The patient will always derive benefit from the internal use of tar-water, which may be taken as the common drink in these cases. This medicine, which was formerly so inordinately praised, and, owing to this circumstance, now so undeservedly neglected, is most serviceable in this and many other chronic affections of the skin. In addition to these, frequent tepid and warm baths, and subsequently salt-water bathing, exercise in the open air, change of air, mental recreation, warm and suitable clothing; regularity in eating, drinking, and sleeping; early rising, and a regular state of the bowels, are important adjuvants.

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ECZEMA. SYN.—*Eczemata* (from *ἐκζέω*, I effervesce). *Eccesmata*, Blancard. *Hidroa*, Sauvages, Vogel. *Ecphlysis Eczema*, Good. *Cytisma Eczema*, Young. *Hydrargyria*, Alley, *Mercurial Lepra*, *Mercurial Disease*, Moriarty and Mathias. *Hitzblätterchen*, Germ. *Dartre Squameuse humide*, *Dartre Vive*, *Hydrargyrie*, Fr. *Heat Eruption*.

CLASSIF.—6. Order, Vesicular Eruptions (*Willan*). 1. Group, *Eczemata* (*Alibert*). 6. Class, 3. Order (*Good*). III. CLASS, 1. ORDER (*Author*).

1. DEFIN.—An eruption of minute vesicles, uncontagious, crowded together, and terminating in the absorption of the fluid they contain, or in superficial excoriations, with more or less serous exudation, concreting into thin flakes or crusts.

2. I. DESCRIPTION.—This eruption may be confined to a single part of the body, or it may attack several parts, or even the whole surface. It most frequently appears in the axilla, the insides of the thighs, the groins, hams, &c. When it is more general, it often extends over the backs

confined. The pustules of impetigo have a larger base, and contain a thicker fluid, than this variety of eczema, which is always vesicular at its commencement, its secretion never consisting of true pus. Impetigo also gives rise to thicker, rougher, and more unequal crusts than it; and is never surrounded by the vesicles of eczema rubrum, as the *E. impetiginodes* always is. — *d.* Eczema, in its chronic state, may be confounded with *lichen agrius*; but the crusts formed by the latter are not so large, nor so thin, as the scales of the former; and when they fall off, they leave not a red, smooth, and shining surface; but a certain roughness, owing to the small prominent papulæ, which are generally evident to the eye, and always to the touch. Also, when lichen becomes dry and scaly, the skin is thicker, and more rugose, than in eczema; and there are commonly some papulæ scattered about, which, by their peculiar characters, further distinguish lichen. — *e.* The vesicles of the early stages, and their presence around the patches of excoriation in the latter periods, as well as the less dry and less friable scales of chronic eczema, will generally distinguish it from *psoriasis*; in which also the skin is more elevated or thickened, and more fissured in parts not influenced by the motions of the joints, than in any of the states of chronic eczema.

14. III. PROGNOSIS. — In its acute form, this affection is generally of no great importance: but in many of its chronic states it often becomes most distressing; and sometimes even embitters existence; opposing, for many months, every known means of cure; and often returning after having been apparently altogether removed. When occasioned by mercury, especially if this mineral have been employed in large quantity, it may assume, as shown above, a most dangerous form; it therefore requires a guarded, and in some instances an unfavourable, prognosis, particularly when pectoral and nervous symptoms are present.

15. IV. CAUSES. — *a.* Eczema is most common in adults; is somewhat more frequent in females than in males; and oftener occurs in spring and summer, than in winter. Susceptibility of frame seems to dispose to it; and there appears to be a predisposition in some constitutions, generally connected with vascular plethora, favouring its passage into a severe and chronic form. — *b.* It is most frequently excited by solar or artificial heat; by the contact of either mineral, vegetable, or animal irritants, — especially the oxides of the metals; by mineral or other powders; by lime, alkalies, dust, and want of cleanliness; by sugar, &c. I have seen it produced on the insides of the thighs and parts adjoining, by the contact of the leucorrhœal discharge, and by the catamenial fluid. Draughts of cold water when the body is overheated, acid, acid fruits, pickles, and shell-fish will also occasion it, especially in some constitutions. Blisters and plasters, and rancid oils or grease applied to the surface, are also among its usual causes. It sometimes, however, appears without any obvious reason; at other times, it seems attributable to indigestible and unwholesome food, to spirituous liquors and similar errors in diet; it being in such cases most obstinate. It is not contagious: but M. Biett supposes that it may be communicated in some cases, as when the exudation continues in contact with a healthy surface. He states, that he has seen it transmitted

from, and to the organs of generation, by sexual intercourse. The specific form is always caused by the use of mercurials — internal or external — but most frequently the latter; and by exposure to cold during their influence. Whether or not the eruption, in such cases, may be in some measure produced by a change in the fatty substance used in oxidizing the metal, is very difficult to determine.

16. V. TREATMENT. — The remedies recommended by WILLAN and BATEMAN, viz. *bever.* tonics and acids, I have found more generally injurious than beneficial. The treatment directed by Biett in his clinical lectures at the "Hosp. Saint Louis," and by his pupils RAYER, CAZENAVE and SCHEDEL, in their works, is decidedly more rational and successful. — *A.* The slighter grades of the acute disease are readily removed by antirefrigerants and emollient diluents, with cathartics, aperients, and tepid bathing. But when the eruption is more extended, is accompanied by smarting, or assumes the form of the *Eczema rubrum* or *E. impetiginodes*, tepid alkaline or sulphuretted baths — made by adding from four to eight ounces of the carbonate of soda or of potash to the water of a whole bath, for an adult; or four ounces of the sulphuret of potassium; — in conjunction with an antiphlogistic regimen; general blood-letting in young plethoric or robust persons; local bleeding in the vicinity of the excoriations; and small doses of the nitrate of potash, with soda, in more laginous diluents; will be required in addition to the above more gentle means. Emollient and soothing applications should also be resorted to. I agree with Mr. PLUMMER, in avoiding all general applications; and with Mr. Biett, in forbidding the use of sulphur, or repeated doses of mercury in this state of the disease; an antiphlogistic and soothing treatment being in every respect most appropriate. I have prescribed with great benefit the biborate of soda, with or without the nitrate of potash, in emollients in the acute form, and after the bowels have been evacuated, the nitrate of soda in similar vehicles. In all cases the exciting causes should be ascertained and removed.

17. *B.* In the chronic states of this eruption, the antiphlogistic treatment recommended above should be employed, where it has been neglected, or insufficiently tried. Purgatives also ought to be frequently resorted to, when the tongue is loaded, and the evacuations unobtainable, and repeated daily until they assume a healthy hue. For this purpose, a mercurial preparation may be exhibited at night, and a purgative draught in the morning. If there be general asthenia and a cachectic state of the frame, a purgative should be of a tonic and stimulant kind; the bark of the *madar* root, or *camellia*, with the nitrate of potash, or with mineral acids, being taken through the medium, but not until mercurial medicines have been relinquished. Dr. ELLIOTSON advises, in addition to bleeding and a low diet, the exhibition of mercury until the mouth is affected; but the latter part of this practice does not agree with my experience; the former I have always directed. It is chiefly when the excoriation is extensive, and the exudation copious, and when depletions have been employed, that acids are to be indicated; morbid secretions having been

tinuous matter; or it is hardened, presenting an intermediate state between a lardaceous and a scirrhous structure, and is more and more dense as it approaches the skin. The muscles underneath are pale, thin, or softened. The lymphatic glands and vessels present evidence of disease, but not uniformly; and one or more of the principal veins are generally obstructed or obliterated, as observed in the cases inspected by MM. BOUILLAUD and GAIDE.

6. *ii. Nature, &c.* — The structural alterations to which elephantiasis is strictly applicable, are evidently remote effects of various states of morbid action, which have either repeatedly returned, or have long continued in the diseased part. From the history of cases, and the changes observed on dissection, the skin, subjacent cellular tissue, the absorbents, and the veins, are evidently more or less implicated; but it is very difficult to ascertain which of these is primarily or chiefly affected. The principal characteristics of elephantiasis have manifestly resulted, in several instances, from disease of the absorbents, or veins, or both. They have also followed, within the scope of my own observation, a chronic affection of the skin, which has extended to the subjacent tissues, and, sooner or later, to either the veins or the absorbents, or perhaps to both. I was lately consulted by a female of middle age, who, during convalescence from a dangerous attack of continued fever, more than ten years previously, experienced hard and painful swelling of one of the lower extremities, depending on disease of the absorbents or veins, or both, according to the account she gave. When I saw her, the limb, below the knee, was very hard, and enormously swollen; and had all the characters of elephant leg; the skin being irregular, scabrous, livid, and fissured. I directed bandages, and the internal use of iodine; but after two or three visits, I saw no more of her, and consequently know nothing of the result. Some time previously, a similar case, as respects its origin and history, although not so severe, came before me. It had been of several years' duration; and had increased gradually after the acute attack in which it originated. The limb was hard, dark red, and livid in parts, somewhat irregular, slightly scaly, and the veins above the tumefied part enlarged. The affection of the skin was here consecutive. Considerable advantage was procured from bandaging, and the internal use of iodine; but the enlargement is not entirely removed. The patient is still under my occasional observation. More than one of the cases I saw in Africa, seemed, on the other hand, to originate in a very manifest alteration of the cutaneous surface.

7. M. ALARD considers elephantiasis essentially to depend upon inflammation of the cutaneous and sub-cutaneous absorbing vessels and lymphatics. Dr. MUSGRAVE also views it, as it occurs in the West Indies, as a consequence of inflammation of the lymphatics, the inflammation being accompanied with pungent heat, and with redness of the skin, and characterised by great tendency to metastasis. He states, that it usually betrays itself in the scrotum, the mammæ, or in some part of the extremities, most frequently about the ankle, or high up the thigh; and, although at first circumscribed, it often diffuses itself over the limb. When the glands are not involved, painful

and indurated chords can be traced to the nearest cluster; but, whatever may be its original seat, the patient is never secure, while the constitutional disturbance subsists, from a sudden retrocession to some vital organ. He has seen it translated from the scrotum to the head; from thence, after a few hours, descend rapidly to the abdomen; again migrate to the chest; and return, perhaps, to the encephalon, and prove fatal there; or resume its more harmless situation, and there run its course. While occupying an internal viscus, it gives rise to the usual symptoms of acute inflammation. Dr. HILLARY and Dr. MUSGRAVE view the local affection as a consequence of fever, which commonly precedes it for two days. Dr. HENDY, however, contends that the fever is symptomatic of the inflammation of the lymphatic vessels and glands. During the acute stage of the disease, either, perhaps, may precede the other; but it is most conformable with just views in pathology, to consider the local change as a consequence of the constitutional disorder; the advanced or chronic state being the result of repeated attacks of inflammation of the lymphatics or veins, and of the integuments, generally existing together, but often originating in, and continuing more or less confined to, either.

8. *Inferences.* — According to the descriptions furnished by TOWNE, HILLARY, HENDY, MUSGRAVE, BOUILLAUD, and GAIDE, and to my own observations, this disease should be viewed — (a) as consisting of certain *acute*, as well as far advanced or *chronic*, states, generally connected with a bad habit of body, and each requiring an appropriate method of cure; and, (b) as arising — *a.* most frequently from inflammation of the lymphatic system and skin, particularly in warm climates; *β.* from inflammation and obstruction of the veins, in some instances, with irritation of the skin in various grades at an advanced period; and *γ.* from the extension of inflammation from the skin to the veins or lymphatics, in other cases. The tumefaction and hardness are necessary consequences of thickening of the *cutis vera* and sub-cutaneous tissue, with deposition of inspissated lymph in the areolæ of the latter, whether arising from chronic inflammation of these structures or from inflammation and obstruction of the lymphatics or veins, or from both these species of alteration.

9. IV. *a.* The DIAGNOSIS of elephantiasis is very easy in the chronic and far advanced state. In the earlier stages, when commencing in either of the parts noticed above, it should be viewed as inflammation of that part, which, in countries where the disease is endemic, may be followed, if not properly treated, by the organic changes constituting its fully formed condition. When this takes place, the great tumefaction and hardness, and especially the circumstance of pressure not being followed by pitting, with the alterations already described (§ 4.), will sufficiently mark the nature of the disease. — *b.* The PROGNOSIS is unfavourable, as respects the removal of the disease, when it is fully formed, although relief may be obtained, and persons may live very many years with it. But it tends generally to shorten life, and always to render it much less comfortable. When it is not far advanced, it may be nearly or altogether removed by treatment. The result, however, will very much depend upon the

ation; others may begin with great excitement, rapidly terminating in exhaustion and depravation of the circulating and secreted fluids; some present great depression from the beginning, the powers of life never rallying throughout, or very imperfectly, with an unnatural state of all the secretions and soft solids, and a tendency to dissolution of their cohesion, which rapidly advances, especially in warm countries, as soon as respiration ceases. In certain circumstances, particularly when great vicissitudes of temperature and weather cooperate with the strictly endemic causes, or with improper living, impure water, &c., dysentery becomes as prevalent as fever, or entirely usurps its place; or the fever assumes a dysenteric character, or passes completely into dysentery; this latter malady producing even a greater rate of mortality than fever itself. (See art. DYS-ENTERY.)

13. *B.* Whilst rich soils, and warm, low, moist, and marshy situations, are productive of disease affecting chiefly the circulating and secreted fluids, and the abdominal viscera, by lowering vital power, especially as manifested in the nervous systems; elevated, cool, or temperate and dry districts favour the developement of vital energy, especially as expressed in the nervous, muscular, and circulating systems, and in the thoracic viscera; and produce diseases of a phlogistic character, as sthenic inflammations of the lungs and circulating organs, of the membranes of the brain, and of the other serous and fibrous structures, hæmorrhages, rheumatism, and fevers of an inflammatory type. — These diseases, however, although the most prevalent, can scarcely be said to be endemic in these latter localities, they being much less frequent than the maladies of the former situations. It should, however, be recollected that the respective endemic influences of districts are not so deleteriously exerted on the native inhabitants, as upon those who have lately removed to them; and that, though they may affect the constitutions of the former class, and give rise to certain diseases in preference to others, yet those diseases are not so acute or violent in them, as in the latter. This circumstance is well illustrated by what is constantly observed in warm countries productive of terrestrial emanations. There, the native inhabitants are either scarcely affected by them, or are liable only to agues, bowel complaints, enlargements of the spleen, or slight ailments referrible to the large secreting organs, excepting on occasions of these exhalations becoming more concentrated or energetic than usual. But persons who have removed thither from healthy localities, in cold or temperate climates, sooner or later are seized by fever, generally of a remittent, or continued type, often assuming an inflammatory or malignant form, and frequently associated with violent local determinations; and it is not until after the frame has been assimilated to the climate by such attacks — usually called the seasoning fever — that agues, dysentery, and the milder forms of disease, appear in such persons. On the other hand, the inhabitants of low or miasmatic situations, who have removed to elevated and mountainous districts, are much more liable to diseases of the lungs, to rheumatism, and to inflammations of a sub-acute or chronic form, than the natives of these latter places; and if the change at the same time involves a change from

a high to a low temperature, the liability to pectoral maladies is still further increased.

14. *C.* When persons have migrated to a country abounding with the sources of endemic disease, a period of longer or shorter duration, according to the activity and concentration of the malarial, and the predisposition of the individual, usually elapses before they are attacked by these maladies. In Rome, and other malaria districts in the south of Europe, as well as in many of those in the eastern and western hemispheres, where the exhalations are not very active, several months, or even a year or two, pass before the unacclimated are seized by fever, unless the exposure and predisposition (see *DISEASE — Predisposing Causes of*) be great. Whilst in many situations, where the emanations are more concentrated, or consist of an admixture of those given off both by vegetable and by animal matters in a state of decomposition, particularly in warm climates and seasons, the first exposure to them is often productive of the most active forms of fever, and in a very short time after the exposure occurs. This is commonly observed in respect of young unseasoned sailors and soldiers, who, coming from a pure air, in a state of high predisposition, are often subjected to these emanations in their most active states. Persons arriving in warm miasmatic districts, from temperate and healthy places, are affected with a celerity and severity generally in proportion to the fulness of their vascular systems, to the rigidity of their fibres, and to their nearness to the epoch of early manhood; but various exceptions to this occur, arising out of the habits of individuals, the susceptibility of their nervous systems, the extent of their exposures, and the states of their minds and moral emotions.

15. *D.* Although the white races of the species will live to an advanced age in warm districts productive of endemic disease, especially if they have removed thither after the constitution has been fully developed; yet their offspring will very seldom reach maturity, or survive the epoch of childhood; if they continue to reside in such situations; or, if they arrive at manhood, they will very rarely reach an advanced age. Dr. Jackson states, that white persons, born and residing in the more unhealthy districts of Lower Georgia, seldom live to forty; and that, at Petersburg, in Virginia, they rarely reach twenty-five. He saw, at this latter place, a person who was only twenty-one; and although he had never been confined by severe sickness, yet he was weak and decrepit: so injuriously does endemic influence operate upon the constitutions of the white variety, even when it fails of inducing acute disease. Bruck records similar instances among the white natives of the banks of the Nile in Abyssinia; and other illustrations have been observed by myself in some parts of Africa. Children born of European parents in India require to be sent to Europe to acquire due maturity and strength, for they very seldom arrive at puberty in India. The case, however, is different when one of the parents belongs to the indigenous inhabitants; but there can be no doubt, that, were a colony of the white races conveyed to the low miasmatic localities within the tropics or in more temperate regions liable to very hot seasons, it would, in a very few generations, become extinct, if intermarriage did

not take place with the natives, or if it were not supplied from time to time from more salubrious places. Whilst a change to a more unhealthy climate is best endured by those who have arrived at full maturity, change to an equally or a more healthy climate is especially beneficial to very young persons, unless in the case of removal of individuals belonging to the dark races to a temperate country, from the hot climate in which they are indigenous.

16. *E.* Besides fevers, dysentery, and the slow blight of the constitutional powers, the localities above described induce, in the white races, diseases of the spleen, liver, and pancreas, both in unassociated forms, and as complications with fevers and dysentery. Among their less obvious effects may be enumerated scurvy, and foul ulcers of the lower extremities. The great prevalence and obstinacy of these latter in miasmatic situations have not been sufficiently attended to, although BAGLIVI had noticed the circumstance in Rome, and CLEGHORN in Minorca. Indeed, in all low places productive of malaria, injuries and sores of the legs heal with great difficulty, whilst those of the head recover rapidly. HIPPOCRATES and CELSUS seem to have been aware of this fact. They both notice the frequent association of indolent ulcers of the legs with enlargement of the spleen,—which is remarkably common among the cultivators of rice-grounds, both in the south of Europe, and in other quarters of the globe.

17. There are some situations, which do not fall within the description given above, productive of diseases almost proper to them, or which are comparatively rare elsewhere; as cretinism, bronchocele, plica or matted hair, Guinea worm, tarantulism, pellagra, &c. These depend in great measure on the water, in conjunction with modes of living, and various other circumstances. — (a) *Cretinism* (see this article) is endemic in the deep ill-ventilated valleys of the Alps and Pyrenees, in Carinthia and the Vallais, in the mountainous parts of Tartary and China, in some parts of the south of France, and in Salzburg. It seems not to have been unknown in this country, two or three centuries ago, in the situations where bronchocele and rickets — very nearly allied diseases — have continued to be common. — (b) *Bronchocele* is very frequent in the situations now particularised, especially in the valleys of the Alps, where it was equally prevalent in the times of PLINY and JUVENAL; in Derbyshire; in Behar, and some other mountainous districts of northern India; in similar situations in Java (S. RAFFLES) and Sumatra; in Bambara, in the course of the Niger (M. PARK); and in Mexico, and some other parts of South America (HUMBOLDT). It is most prevalent in females after puberty; and is, in my opinion, often connected with interrupted or irregular catamenia. — (c) *Plica*, or *matted hair*, is not noticed by the ancients, and it is doubtful when it first appeared — probably some time between the thirteenth and fifteenth centuries. It is most common in Poland and Lithuania; but it is met with occasionally in Transylvania, Hungary, the southern parts of Russia and Tartary, and more rarely in Switzerland, Belgium, and Prussia: but it is not so frequent, even in Poland, as it was a century ago. It proceeds chiefly from want of cleanliness, especially in respect of the hair, and to wearing too warm

coverings on the head (KERCKHOFFS, LARRY, ALIBERT, &c.). There appears to be frequently an hereditary predisposition to it; but the cause now assigned is evidently the most influential in producing it, assisted by the use of unwholesome water (VICAT). It is most common amongst the poorest classes. According to Dr. L. KERCKHOFFS (*Med. Trans. of Coll. of Phys.* vol. vi. p. 27.), it is not infectious (see art. HAIR). — (d) *Tarantulism* (see CHOREA, § 18.) was formerly endemic in Apulia, but is now by no means so frequent (LAURENT and MERAT). This species of irregular convulsive or hysterical affection, in which the moral emotions seem more disordered than the physical powers, was imputed by Sir T. BROWNE, BOYLE, KIRCHER, BAGLIVI, MEAD, and SAUVAOES, entirely to the bite of the tarantula spider, which probably is an exciting cause, in certain states of the nervous system, although neither the only nor the chief cause. CORNELIO, SERAO, and CIRILLO, physicians in Naples, and M. NOLLET, have taken juster views of its origin; and refer it rather to the state of the nervous system, in connection with the moral emotions, than to this insect. Indeed, it is extremely probable that it is often feigned, or frequently occurs, without any such accident as that to which it is so commonly imputed; for very nervous and fanciful females may persuade themselves that they are stung by this insect, in order to account for their ailments, conformably with the vulgar opinion, and may thereby induce that form of irregular chorea or hysterical affection to which the term tarantulism or tarantismus has been applied. M. MERAT (*Dict. des Sciences Méd.* t. liv. p. 345.) infers that the inhabitants of Apulia, owing to situation and climate, are liable to nervous and spasmodic affections; and that, among others, this is apt to supervene, — from their ardent and choleric dispositions, and their love of dancing and music. In Calabria and the Apennines, where chorea and convulsive affections are common, tarantulism also occurs (FERRUS). — (e) The *Guinea worm* (*Dracunculus*), the long thin worm which is sometimes found in the inhabitants of certain localities, generally under the integuments, and so named from the circumstance of its having been first accurately observed in the natives of Guinea, is now seen in other countries. It appears from PLUTARCH to have been met with in the inhabitants near the Red Sea. It occurs among the negroes in most of the low marshy situations of intertropical Africa (WELCH, BRUCE, PARK, &c.); in the slaves, and sometimes in the whites, in the West India islands (CHISHOLM, THOMAS, &c.); in Bombay, and along a great part of that coast, as well as in some other maritime districts of India (M'GRIGOR, MILNE, H. SCOTT, GRANT, &c.); and in the islands of the Persian Gulf (KEMPFER). — It is observed chiefly during the months of November, December, January, and February, in both the East and West Indies. M. DUBOIS found, in parts of the Carnatic and Madura, more than one half of the inhabitants of some villages affected by it. Dr. CHISHOLM (*Edin. Med. and Surg. Journ.* vol. xi. p. 145.), Dr. SMYTTAM (*Trans. of Med. and Phys. Soc. of Calcutta*, vol. i. p. 179.), Dr. ANDERSON, and several others, state that it is met with chiefly in those who use wells made in argillaceous soils, impregnated with salt or percolated

by sea water. M. DUBOIS adds, that the inhabitants of villages who take water from one well are subject to this worm, whilst those at the distance of only half a mile, who resort to a different well, are not affected by it. Other writers, in addition to those named above, agree in ascribing it to brackish waters containing the ova or embryo of this worm. The circumstance of this animal having been rarely found out of the human body has induced Dr. MILNE (*Edin. Med. and Surg. Journ.* No. 106. p. 112.) to suppose that the substance taken for it has been a diseased lymphatic vessel; but the evidence of its independent existence furnished by Dr. H. SCOTT (*Med. Chir. Rev.* vol. iv. p. 182.) and Dr. R. GRANT (*Edin. Med. and Surg. Journ.* No. 106. p. 114.) has set the matter at rest. As to the manner in which this worm becomes lodged in the sub-cutaneous cellular tissue, much doubt exists. It must either insinuate itself through the skin from without, or its ova escape the action of the alimentary juices, and pass along with the chyle into the circulation, and thence into the cellular tissue, where, having attained a certain growth, it excites the irritation preceding its expulsion. But, if it pass by this latter route, how is it that it is never found in the cellular or other parts of internal organs, where it may be expected to produce dangerous, if not fatal, effects?

18. F. In low, moist, and cold districts, liable to frequent vicissitudes of weather and temperature, catarrhal and rheumatic affections, croup, bronchitis, scrofula, rickets, and tubercular diseases, are more or less prevalent; and in those similarly situated on the sea-coast, where the inhabitants live chiefly on fish — particularly on stale or dried fish, or the grey kinds — chronic eruptions on the skin are common. In large towns and cities, where a confined and impure air co-operate with the anxieties of business, the exhaustion of mental exertion or of dissipation, the luxuries of refinement, the conflict of the passions, and the excitement of the different moral emotions, disorders of the nervous system, frequently implicating the manifestations of mind, are more common than in the country, and much more so than in imperfectly civilised states of society. — My limits will admit only of a simple reference to other endemic diseases — to the prevalence of trismus and tetanus in the West Indies; of elephantiasis in these islands, and in the East, as well as in Africa; of the yaws in the negro race; of the pellagra in Lombardy and the Milanese; of the beriberi in the East Indies; of hepatic colic (see COLIC, § 20.) in Spain and the West Indies; and of ophthalmia in Egypt. Some of these may be imputed to obvious physical causes; as the ophthalmia of Egypt to the reflected heat, and the dust in the air; or pellagra, and some cutaneous diseases, to dirty habits and unwholesome food: but there are others that cannot be explained without ascribing them to the co-operation of a variety of circumstances, as shown in the articles on these maladies. In illustration of the influence of occupations in producing a certain train of morbid actions in those similarly circumstanced, it may be stated, that amongst the children and young persons employed in cotton mills, more especially in Manchester, chorea, which is comparatively a rare disease, is one of the most common; scrofula, tubercles, and debility in all its states, being

likewise very prevalent; and that, in the somewhat older work-people, chronic rheumatism, in all its forms, is remarkably frequent. The protracted periods of occupation in a very hot and moist air, and generally in a standing posture; the sudden exposure to a cold atmosphere on every occasion of leaving the factory; and the want of due sleep, of exercise in the open air, and often of sufficient nourishment, independently of various moral causes; sufficiently explain the endemic prevalence of these diseases in the large manufacturing town now mentioned. (See AIR AND EMPLOYMENTS — as Causes of Disease.)

19. iii. *Of the Mode of Operation of Endemic Influence on the Economy.* — The endemic causes productive of the more acute and malignant diseases were supposed by CULLEN to be direct sedatives, not merely lowering vital power, but also inducing spasm of the extreme capillaries; and that, if the vital energy of the system is not entirely overpowered by them, reaction supervenes, in order to overcome this spasm, and thus fever becomes developed. Other pathologists suppose that marsh effluvium acts as a stimulant or irritant; and that the debility which it obviously occasions is either consecutive, or a state of exhaustion. Neither of these hypotheses accounts for the whole phenomena which diseases, arising from this cause, evince throughout their course, although either explains many of their symptoms. That malaria depresses vital power, contaminates the circulating and the secreted fluids, and weakens the vital affinity or cohesion of the soft solids, is shown by its more immediate, as well as by its consecutive effects upon the living body, and by the fact of dead animal matter running faster into putrefaction in situations where it abounds. Its specific operation on sores and wounds is often evinced during life. It has been repeatedly proved, that substances fabricated of silk, woollen, and even of cotton and flax, exposed to marsh exhalations, very rapidly undergo decay; silk and woollen becoming putrid, and cotton and linen assuming a dingy or yellow hue, and afterwards losing their cohesion. These effects are generally rapid and complete, in proportion to the moisture and warmth of the air, and the concentration of malaria in it; and so well are they known, M. MONTFALCON states, that they are generally recognised by the more intelligent inhabitants of Italy and the south of France, as indications of the malarial brity of particular places and seasons.

20. iv. *Of preventing the Production of Endemic Causes, and of counteracting their Effects.* — A. (1) *preventing the generation of malaria.* — (a) *Draining marsh grounds* is one of the most effectual modes of preventing the formation of malaria, but it should be recollected that uncovered drains and ditches are fruitful sources of endemic influence. — (b) *Embankments thrown up against foundations from rivers and the sea* are also important means of prevention; but, if they be not quite adequate to the purpose, they may aggravate the evil, by preventing the water from retiring with sufficient rapidity. — (c) *In situations admitting of neither of these means being employed*, then advantage will often be derived from *covering them entirely with water*; for lakes do not exhale miasmata until after the mud and soil of their bottoms and sides have appeared above the surface. SEMAC states, that the outskirts of a

large town became unhealthy as soon as the mud at the bottom of some adjoining morasses was exposed to the sun and air; but that disease disappeared when they were completely inundated. Dr. ROLLO mentions, that mild intermittents prevailed in St. Lucie during the rains, when the pools and marshes were filled; and that dangerous fevers appeared after their slimy surfaces became exposed and completely dry. Mr. ANNESLEY records similar facts in relation to various places in the East Indies. The ditch round the ramparts of Geneva was once drained, and sickness prevailed in the vicinity, but disappeared when it was again filled. And the water-courses and beds of rivers that are dried up in summer, particularly in warm countries, and thereby become sources of malignant fevers, are quite innocuous when filled (FERGUSON, &c.). — (d) *Clearing the soil* from its more bulky vegetation will be beneficial only when an assiduous cultivation is adopted, without the necessity of having recourse to a very abundant irrigation. In many circumstances, however, this measure will greatly aggravate the insalubrity of a district, as shown above, especially in respect of low swampy places within the tropics, or near the sea. Facts illustrative of this have been often observed in both the old and new worlds. — (e) Protecting the soil in which large cities are built, particularly when situate near the embouchures of rivers, &c., from the action of the sun, by a closely laid pavement; intersecting the strata of earth by large deep sewers, conveying the exuvie and other impurities beyond the reach of the inhabitants, and in such a way as to prevent the escape of emanations from them, in the midst of a dense population; and removing places of sepulture beyond the outskirts of cities and towns; are measures of the utmost importance to the health of the community.

21. It is established beyond a doubt, that the narrow winding streets of towns built in low situations, or in the vicinity of marshes, are, especially when the houses are high, actually conducive to health; inasmuch as the exhalations transported from thence have a less ready access to all parts of them, the horizontal currents of air being more completely intercepted by the nearest buildings; also, when the streets are narrow, and the houses high, the sun cannot act upon the soil, which necessarily becomes saturated with animal exuvie, unless deeply intersected and purified by drains and sewers. The importance of this consideration was not overlooked by the ancients, as appears from the remark of TACITUS, on the rebuilding of Rome after its destruction by Nero. “*Erant tamen, qui crederent, veterem illam formam salubritati magis conduxisse, quoniam angustiae itinerum, et altitudo tectorum non perinde solis vapore perurperentur. At nunc patulam latitudinem, et nullam umbram defensam, graviore aestu ardescere.*” (*Ann. l. xv. 43.*)

22. B. Whilst the above measures have reference chiefly to the prevention of the formation of terrestrial exhalations, there are others that may be employed to *confine them to the sources whence they issue*, when the former means are ineffectual, or cannot be put in practice. It is very probable that many places, the insalubrity of which was recognised and guarded against by the ancients, have actually become more unhealthy in modern times, owing to the accession of alluvial

soil washed down from the higher grounds in the vicinity; to the accumulation of decayed organised matter and mineral detritus at the mouths of rivers, and in the bottoms of lakes, which have been thereby converted into marshes; to the neglect of the drainage and cultivation which a former crowded population was enabled to preserve; and to the removal of those screens of trees which confined the exhalations to the place that generated them. The importance of these considerations has been insisted on by LANCISI and BROCCHI, in respect of Italy; by MONFALCON, with reference to France; by ANNESLEY and myself, in regard to warm climates; and by M'CULLOCH, as respects this country. It was remarked by PLINY, and some others among the ancients, that trees absorb the exhalations which prove injurious to man; and the observation is perhaps just; but whether trees simply obstruct the transit of malaria from its source, and confine it there, or actually absorb it along with the moisture in the air, and dew which rests on their leaves; or whether they act in both ways, in addition to their shading the soil from the action of the sun; the power they possess, in low and marshy situations, of moderating the generation of malaria, and confining it to its source, is indisputable. It is, therefore, important to plant trees around, and more especially to leeward of, unhealthy places (§ 5.), in order to screen persons living in their immediate vicinity from their influence. Owing to the extent to which trees, high houses and walls, and intervening water, not liable to become stagnant, protect places near the sources of malaria from its effects, is to be explained the fact of the inhabitants of one side of a street, or road, often escaping ague, whilst many of those living on the other side are affected; and of the crew of one ship being seized with fever, while those of another, somewhat further removed from the shore, escaped.

23. C. There are other means, besides those enumerated, *which both destroy and counteract, or otherwise remove, the causes of endemic maladies.* — (a) In the case of impure water, filtering it, especially through charcoal; boiling it before it is used, or passing it through lime; preserving it in iron tanks on board ships; and adding to it a small quantity of either of the chlorurets, when it cannot be otherwise deprived of a portion of animal matter; are very important precautions. When sewers, drains, ditches, and other confined sources of impure air cannot be removed, or covered so as to prevent the emission of effluvia, the chloruret of lime should be thrown into them from time to time. A solution of the same substance, or either of the other chlorurets, ought also to be liberally employed in the wards of crowded hospitals, whenever the air becomes close and foul, in order to prevent the prevalence of fever, dysentery, erysipelas, and gangrene; and should also be poured down the privies. Similar precautions ought also to be employed in crowded transports and ships of war, as well as in camps and besieged towns, more especially if disease appears. But this means is only subsidiary to free ventilation, and is most to be confided in when the latter cannot be established. By having recourse to these disinfectants, the sickness that sometimes arises from the leakage of sugar, or the decomposition of vegetable matter collected

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ENTERITIS. See INTESTINES — Inflammation of.

ENURESIS. See URINE — Incontinence of.

EPHELIS. SYN. — Ἐφέλις (from ἐπὶ, and ἥλιος, the sun). *Macula Fusca*, Plenck. *Epi-chrosis Ephelis et Lenticula*, Good. *Ephelides*,

Alibert. *Ephélide*, Fr. *Spotted Discolouration of the Skin*.

CLASSIF. — 10. Gen. 3. Order, 6. Class, (Good). 1. Gen. 8. Order, Maculae (Bateman). I. CLASS, V. ORDER, (Author).

1. DEFIN. — *Discolourations of the skin, varying from a yellowish grey to a dark brown, and from minute points to large patches, and either scattered, confluent, or corymbose.*

2. I. FORMS AND HISTORY. — HIPPOCRATES applied the term ephelis to the freckles produced by the sun; but he also extended it to the spots sometimes seen in the faces of pregnant females. This extension of the term was adopted by ORIBASIIUS, AETIUS, ACTUARIUS, and GORREUS; and carried even much further by PLATER, SAUVAGES, and ALIBERT. Other words have been employed by modern writers as a designation either for ephelis generically, or for certain of its varieties, as will be stated hereafter; but, as this appears to have been the original one, I shall adopt it here. The change of colour characterising it is not seated in the cuticle, but in the pigmentum which gives the hue to the skin. It seems, in some instances, connected with a deficient tone of the extreme vessels; and is very variable in its progress, occasionally coming on slowly, sometimes rapidly and extensively. It is often of long duration, or even permanent; and in other cases it soon disappears, either spontaneously or after the application of some lotion. In itself, it cannot be considered to require medical interference; but certain of its forms are important as symptoms of internal disorder. It may be divided into two species — the *lenticular* and *diffused*.

i. LENTICULAR EPHELIS. SYN. — *Ephelis Lenticularis*; *Lentigo*, *Lenticula*, Auct. Lat.; *Ephelis Lentigo*, Sauvages and Todd; *Lentigo Ephelis*, Frank; *Pannus lenticularis*, Paget; *Ephélide lentiforme*, Alibert; *Freckles*.

3. This species is characterised by its fawn or brown colour, the spots being generally very small, and always under the size of a lentil, disseminated or in clusters; and without any elevation of the cuticle, or attendant irritation. Dr. Todd has very properly divided it into two varieties — viz. that which is congenital or dependent upon the complexion, and consequently sometimes hereditary; and that which is caused by the sun.

4. A. *Congenite Ephelis*; φαῦς, Gr.; *Tâches de Rousseur*, Fr.; *Ephelis Lentigo materna*, Todd; *Congenite Freckles*. — This variety occurs most frequently in persons of a very fair complexion, with a delicate skin, and yellowish or reddish hair; and sometimes in those with a very white skin, and dark hair and eyes. The spots are lenticular, persistent, and not confined to the parts exposed to the light; but are in some cases disseminated over the body. They frequently do not become very apparent until some time after birth, or even not until the child is five or six years old. The darkness of the discolouration varies as above (§ 1.), with the colour of the hair or eyes, and usually remains till old age.

5. B. *Solar lenticular Ephelis*; *Lenticulae Solares*; *Maculae Solares*, Plenck; *Ephelis a Sole*, Sauvages; *Lentigo aestiva*, J. Frank; *Summer-flecken*, *Sonnensprossen*, Ger.; *Evanescent Freckles*. — This is a common lenticular discolouration, occurring in young persons, especially females,

connected with imperfect secretion, excretion, and assimilation, these functions should be assisted by mild, cooling, and alterative purgatives, light diet, and moderate exercise. Very small and frequent doses of blue pill or hydrarg. cum creta, may be given with Castile soap and taraxacum, or with the aloes and myrrh pill, if the catamenia are scanty; or with ox-gall in addition. The internal use of the *créasote* may also be tried. I have prescribed it, in one case of this kind, with great benefit. Sulphurous mineral waters may also be taken; and lotions with the sulphuret of potassium, or with nitre and camphor julap; or sulphureted fumigating baths resorted to.

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EPIDEMICS. — *Epidemic Diseases*; 'Επιδμία, 'Επιδμία, 'Επιδμία (from ἐν among, and δῆμος, people). *Epidemia*, *Epidemius*, *Epidemicus*, *Morbi Epidemici*, *Morbi Publici*, *Morbi Populares*, Auct. Lat. *Epidemie*, Fr. *Volkskrankheit*, Germ. *Epidemia*, Ital. *Epidemy*, *Epidemic Influence*. *Epidemic Constitutions*.

CLASSIF. — GENERAL PATHOLOGY.

1. **EPIDEMICS** are such diseases as occasionally prevail more or less generally in a community at the same time or season, and depend upon a common cause.—They recur at uncertain periods; and continue to prevail for a time varying from two, three, or four months, to as many years, or even longer. When their spread is most extensive, or throughout countries differently circumstanced as to climate, &c., or when they are universal in their attack, they have often received the appellation of *Pandemic* (πανδημία or πανδημία, from πᾶς, all, and δῆμος, people). When, together with their very general prevalence, they occasion a very great mortality, they have usually been denominated *pestilential* (see art. *PESTILENCE*). They are commonly acute and febrile, and often rapidly run their course. They appear at any season of the year; but most frequently in autumn, summer, and spring. They are distinguished from *endemic* maladies by the circumstance of these latter being occasioned by peculiarity of situation. But it should be recollected, that *endemic* diseases may be converted into *epidemics* of a very fatal kind by those *influences*, either obvious or inferred, to which attention will be directed in this article; and which, acting either separately or in combination, modify the character, whilst they cause the prevalence, of disease.

2. I. **CAUSES, &c.** — The *Influences* whence *epidemics* proceed may be traced in many instances; and in others, particularly those that are *pestilential*, they cannot be inferred with the same

degree of probability. Certain *epidemics* have manifestly arisen out of combinations of circumstances, the nature and operation of which admit not of dispute, whilst some have presented only certain elements of their causation, others being wanting to explain fully all the phenomena observed. — A. Amongst the most important elements of *epidemic influences*, are those *endemic sources* which are amply described in the articles *CLIMATE* (§ 3—32.); *DISEASE — Causation of*; and *ENDEMIC INFLUENCE* (§ 5.). These sources often perform very important parts in the causation of *epidemics*, upon the addition of some other cause, either manifest or concealed; *endemics* being sometimes the parent stock upon which *epidemics* are engrafted; the latter varying in character with the nature of the superadded cause or causes, especially those which are about to be noticed. Several of these additional causes may consist merely of certain changes, from the usual course of the seasons, which obtain in these localities; as prolonged drought, or protracted rains; and, still more, the former following the latter; and particularly if conjoined with increased temperature. As long as the temperature continues low, very material changes in the state of the seasons may not be productive of any increase of disease in unhealthy situations, unless other causes come into operation, as infection, deficient or unwholesome food, &c. *HUFELAND* states that, in 1815 and 1816, in the north of Germany, the seasons were remarkably wet, and the temperature low, and yet the public health was very good; that intermittents and low fevers were rare, even in marshy localities; inflammations and rheumatism being the predominating maladies. In warm countries, however, protracted and heavy rains generally occasion *epidemic* disease, especially in low and marshy places, during the subsequent hot or dry season, or when great numbers of persons are crowded in a small space; and, moreover, impart to it an asthenic and infectious character. Of diseases originating in local sources, becoming infectious and *epidemic*, I could adduce several instances in modern times, *LIVY* (l. xxv. 26.) states that, during the siege of Syracuse by Marcellus, 213 years B. C., a pestilence broke out in both armies; and that it occurred in autumn, and in a situation naturally unhealthy. "At first," he observes, "persons sickened and died, owing to the unwholesomeness of the place; afterwards the disease spread by infection, so that those who were seized were neglected, or abandoned, and died, or their attendants contracted the disease." He further adds, that the dead affected the sick, and the sick those in health, with terror and pestiferous stench; that the disease was more fatal to the Carthaginians than to the Romans, who, in this long siege, had become accustomed to the air and water; and that, in the same year, an *epidemic* visited Rome and the adjoining country, which was remarkable rather for passing into chronic affections, than for the mortality it occasioned. Although some of the sources of *endemic* disease may, by the aid of concurrent causes, as in the instance now quoted, give rise to *epidemics*, yet *pestilential* *epidemics* otherwise originating, as in infection, have sometimes spared places which have seemed to abound the most in certain causes of insalubrity; but this has occurred only when

those places have emitted a powerful stench and ammoniacal vapours, or other strong odours, which have either counteracted or neutralised the exhalations or miasms which have spread the infection.

3. *B.* The seasons have a very remarkable influence upon certain epidemics, as those of yellow fever and plague; and but little on others, as pestilential cholera, influenza, &c. As respects those epidemics which are less universal and fatal, the influence of the seasons is more or less manifest.— In *spring*, various forms of angina, croup, bronchial affections, inflammations of the lungs and pleura, catarrhs, rheumatism, hooping cough, tertian or quotidian agues, and the febrile exanthemata, as measles, &c., are usually most prevalent.— In *summer*, certain of the above diseases will often remain, with continued fevers of various forms, erysipelas, smallpox, stomach and bowel complaints, &c.— In *autumn*, the diseases of summer either continue or become more prevalent, especially cholera, dysentery, and colicky affections; and quartan or irregular agues, remittents, sore throat, scarlatina, inflammations, or obstructions of the abdominal viscera, &c. are also frequent.— In *winter*, inflammations of the thoracic and respiratory organs, rheumatism, and low or typhoid fevers are most common; and, in close or crowded places, infectious effluvia, either from the sick or from accumulated filth, are readily generated, when the air in heated apartments becomes stagnant. HIPPOCRATES had remarked that, when the seasons are regular, diseases are also more regular in their course; and, unless during the prevalence of epidemics, the observation appears just.

4. *C.* The weather has a considerable influence on the prevalence of the more common diseases. Protracted droughts are unfavourable to pulmonary diseases, with the exception of bronchorrhœa, and frequently excite inflammations and inflammatory fevers. During, and soon after, very wet seasons, gastric, remittent, and intermittent fevers, catarrhal and rheumatic affections, dysentery, diarrhœa, and sore throat, are often epidemic. The frequent recurrence, or the continuance, of high and cold winds, occasion catarrhal, pectoral, inflammatory, and rheumatic diseases; and warm or hot winds induce remittent and bilious fevers, cholera, ophthalmia, &c. Calm humid states of the air promote the spread of continued fevers, and all infectious and contagious maladies; and similar conditions of the atmosphere, conjoined with great heat, favour the prevalence of adynamic and malignant fevers of a continued or remittent type; whilst very hot and dry seasons give rise to synochal and ardent fevers, to bilious remittents, cholera, and inflammations of the liver, stomach, and bowels.

5. Although the states of the atmosphere here enumerated very frequently produce the effects ascribed to them respectively, yet other causes aid their operation. Writers, from HIPPOCRATES downwards, have attributed too much to irregularities and sudden vicissitudes of season in the production of epidemics, more especially of those which are very general or pestilential. I believe that this cause is instrumental chiefly in augmenting the number of cases of the diseases common to a country; and that it is very seldom the only, or even the chief, source of wide-spreading or pestilential maladies, although it may aid their generation

and diffusion. On this point I cannot agree with Dr. HANCOCK, M. FODÉRÉ, and some other modern authors. That this dictum of Hippocrates was not altogether believed, even in ancient times, may be inferred from the frequent exceptions to it adduced by historians and medical writers. TACITUS (*Annalium*, l. xvi. 13.), when noticing the epidemic that raged at Rome in the year 68, states, that there was no irregularity of season or weather to account for it. The plague that prevailed so long, and spread so generally, between the middle and end of the sixth century, and which has been fully described by PROCOPIUS and EVAGRIUS, who were witnesses of it, was in no way dependent upon irregularity of season, but was evidently propagated by infection. The following remarks of ERASER are, according to the experience of every candid observer, perfectly characteristic of an infectious pestilential epidemic:—"Some perished by once entering into, or remaining in, the infected houses; some by touching the sick. Some contracted the disease in open market; others, who fled from infected places, remained safe, while they communicated the disease to others, who died. Many who remained with the sick, and freely handled the dead bodies, did not contract the disease." (*Eccles. Hist.* l. iv. cap. 29.). The pestilence called the Black Death, which visited nearly all the then known world in 1347, 1348, 1349, and 1350, was equally independent of irregularity of season or deficiency of food. PARKER (*Ant. Brit.* p. 360.) states, that it first appeared in the south of England about Christmas, 1346, and amidst the greatest abundance of provisions. THUANUS and RIVIERUS, when noticing the epidemic that broke out in France in 1580, remarked that the crops that year were plentiful, and the sky serene; so that it was thought that the disease was produced rather by the influence of the stars than by the malignity of a corrupt air. WEBSTER (*On Epidemic Diseases*, vol. i. p. 323.) admits that the summer in 1665, in England, when the plague commenced in London, was very temperate, the weather fine, and the fruits good. All the writers of the day agree that no cause of pestilence could be observed in the states of the seasons. The epidemics of our own days also prove that, although irregularities of seasons and weather may aid the endemic sources of disease, or increase the prevalence of the common diseases, they are by no means amongst the chief causes of pestilential maladies.

6. *D.* In connection with, and often resulting from, irregularity and inclemency of seasons, an unwholesome and deficient food sometimes performs an important part in the production of epidemics.—a fact which seems to have been well known and guarded against by the inspired lawgiver, MOSES. In *Deuteronomy* (ch. xxviii.) the Israelites are warned against transgressing his laws; and are threatened, as a consequence of disobedience, with the diseases of Egypt—the botch, the scab, and the emerods; maladies known at present by the names of elephantiasis, leprosy, and plague, respectively to prevail in that country; and in *Numbers* (ch. xi.), they are stated to have been seized by pestilence from eating a great quantity of the flesh of quails, which had fallen in surprising numbers around their camp, after having been

10. *b.* Other authors have ascribed an unusual prevalence of disease, or the appearance of pestilential epidemics, chiefly to the states of electricity in the air, and on the earth's surface. That certain conditions of this agent should affect the animal economy, and either predispose it to be infected by the exciting causes, or of itself be a principal cause, of disease, is probable; but we have no direct proof of any connection between epidemics and known changes in the electrical states, either of the air, or of objects on the earth's surface; and even granting that such connection exists, there is no evidence that this agent can produce the morbid effects ascribed to it. It is impossible to reconcile the modes in which epidemics are observed to diffuse themselves, or the peculiar and novel characters they often assume, or the very opposite physical circumstances in which they occur, merely with changes in the electric fluids, often of inappreciable and insensible kinds. Indeed, experience rather shows that the body may be made the medium of a very energetic, electrical, or electro-motive, action, without any injury being inflicted on it; and it is only when a very powerful and very manifest current of either the negative or positive electricities strikes, or passes through it, that life is thereby in any way affected.

11. *c.* Numerous instances have occurred of the lower animals participating in the fatal effects of an epidemic constitution, and they have been adduced by modern authors as proofs of the existence of a noxious effluvium in the air, however it may have been generated. Thus it has been observed, that epizooties have preceded the prevalence of fevers; that catarrhal affections in horses have been followed by influenza; that birds have either forsaken the vicinity of a town ravaged by a pestilence, or have fallen dead when flying over it; and that numerous species of animals, particularly domestic animals, have died in houses visited by pestilential maladies. These phenomena have been adduced as proofs of the existence of some one of the agencies placed under this head. Without disputing their actual occurrence, or attempting to reduce them to their exact dimensions, from which they had been exaggerated for the purposes of argument, I will receive them as they have been described by those who have adduced them in support of their views.—1st. As respects epizooties in connection with epidemic fevers, LANCISI, RAMAZZINI, and still more modern writers, have furnished much information. It has very frequently been observed, when the prevailing fevers have been an exaggerated form of the endemic of the country, or when endemic sources have been manifestly concerned in their causation, that the lower animals, especially horned cattle and sheep, which derive their sustenance chiefly in places productive of malaria, are the first to experience its effects, when it is more than usually active or concentrated. This is nothing more than what might be inferred *à priori*. We know that remittent and continued fevers, in various forms, are frequently epidemic, especially in marshy countries in the south of Europe; are chiefly dependent upon local sources, aided by heat, crowding, imperfect ventilation, neglect of cleanliness, and the state of society; and are often either preceded or accompanied by epizooties. Such occurrences are as old as the

records of history extend; and have been adverted to in the Books of Moses, as well as in those of the PROPHETS. HOMER has signified the connection, and EUSTATHIUS and SPONDANIUS have explained it, in their commentaries on the Iliad, as satisfactorily as any philosopher of the present day. EUSTATHIUS, the celebrated critic of the twelfth century, ascribes the disease that broke out in the Grecian camp, in the tenth year of the siege of Troy, to immoderate heat and gross exhalations: and DE SPONDE, or SPONDANIUS, as he is commonly called, conceived the circumstance of the mules and dogs having been affected before man, to have been owing to their natural quickness of smell, rendering the exhalations sooner perceivable and operative; and to their feeding on the earth with prone heads, whereby effluvia are more readily inhaled, and before they rise so as to affect man, or become diffused in the air.

12. A connection similar to the above, and evidently proceeding from the same sources, especially in warm or dry seasons, consequent upon the inundations of low grounds or marshes, is mentioned in various places by LIVY. That the epidemics, which were thus consequent upon or attended by epizooties, were of the nature I have contended for, may be inferred from the following notice he has recorded of an epidemic fever which was remarkably destructive in the year of Rome, 576:—"Pestilentia, quæ priore anno in boves ingruerat, eo verterat in hominum morbos. Qui inciderant haud facile septimum diem superabant qui superaverant longinquo, maxime quartanæ implicabantur morbo. Servitia maxime moriebantur; eorum strages per omnes vias insuperatorum erat. Ne liberorum quidem funeribus Libitina subiciebat. Cadavera intacta a canibus ac vulturibus, tabes absquebat; satique constabat nec illo, nec priore anno, in tanta strage boum hominumque, vulturium usquam visum." (L. xli. 21.) Here the commencement of the disease amongst the cattle, its subsidence into the intermittent type, its greater prevalence in the lowest classes, and the absence of birds of prey from the infected atmosphere, are proofs—1st, of its having originated in malaria, and possessed the characters distinguishing this class of fevers; and, 2d, of the effect of the contaminated air and diseased bodies on animals of prey. The destructive epidemic that ravaged Rome in the year A. D. 187, and many parts of Italy, was attended, rather than preceded, by a disease in cattle. HERODOTUS (L. i.) ascribes it to the great concourse of people, assembled from all parts of the earth, and to an unfruitful year, and consequent famine,—causes most likely to generate infection, particularly when aided by others which are seldom absent under such circumstances. Although this connection of epizooties and epidemics may be explained as was attempted by EUSTATHIUS and SPONDANIUS, yet it is not improbable, that cattle confined together in a state of disease will generate an effluvia, remarkably injurious to men; that the use of the flesh of diseased animals, as may be inferred to have been the case in the epidemic last noticed, will have a similar effect; and that, when aided by other noxious agents, both these causes will occasion an infectious malady, which will spread with great rapidity and mortality under the circumstances in which

imperfect ventilation ; — 2d. That the combination of these exhalations with those emitted by decayed vegetable matter, and by deep absorbent soils, gives rise to effects of greater severity than those occasioned by either operating separately ; and that the intensity of these effects will depend upon the temperature, humidity, and stillness of the air, and other concurrent circumstances ; — 3d. That emanations from dead animal matter, in the various states in which it is met with, are capable of causing, even of themselves, serious effects, as shown in the article *Dysentery* (§ 23.) ; and that, when aided by high ranges of temperature and humidity, they are often productive of extensive disease, which usually assumes, especially in a crowded population, and calm atmosphere, infectious properties ; — 4th. That even when they have not been the chief element or cause of the epidemic constitution, they have been, not unfrequently, concurring agents.

15. It is recorded in the *Magdeburgh History*, that, in the year 394 or 395, swarms of locusts covered Judea ; and were driven by the wind into the sea, and washed on the shore of Palestine ; they filled the air with foetid effluvia, which occasioned pestilence among men and cattle. In this case, the high temperature of the country, very probably famine — the frequent consequence of swarms of these insects — and other causes, concurred in the production of this epidemic. It is likewise stated in the same history, that swarms of locusts covered a great part of France in 874, and were driven by the winds into the British Channel ; and, having been washed on shore, caused such a stench and sickness, aided by a famine, as to destroy about a third of the inhabitants of the French coast. I have stated that the *dysenteries* (see that article), which have been very generally epidemic immediately after very destructive pestilences, have been occasioned chiefly by the exhalations proceeding from the immense number of dead bodies, and by the presence of animal matter in the water. It is more, even, than probable, that pestilences are perpetuated in large cities from this circumstance ; and that the prolonged epidemics, of which Rome, in her rise, in her acmé, and in her decay, was so frequently the seat, were partly owing to this cause, which neither burning nor burying the dead bodies could prevent. During the very prolonged pestilence that ravaged Rome in 262 and 263, the air is described by EUSEBIUS to have been so corrupt, as to form on the surface of objects a mould or tabid dew, such as proceeds from putrid bodies : — “*Ros quidam tabidus e cadaveribus putridis* ;” — or, as CEDRENIUS expresses it, “*Ros saniei mortuorum similis apparebat*.”

16. *G. Infection and contagion* are amongst the most important agents in the spread of certain epidemics ; but great misapprehension has existed, as to the extent of their influence, the exact parts they perform, and their mutual connection. Many writers have erred remarkably in viewing epidemic diseases as being necessarily infectious, and even contagious ; and others, in considering them entirely devoid of infectious and contagious properties. The importance of determining in how far they possess either property, and are diffused in consequence ; and the great interest of

the subject, in medical, commercial, and political points of view ; have given occasion to much and to warm discussion — a great part of which has not been calculated to advance the cause of science, or to elevate the medical character in public estimation. The subject of contagion, in all its relations, is fully discussed in the article *INFECTION*. I can, therefore, only allude briefly to a few of its connections with epidemic maladies.

17. 1st. A foul air may be generated by the crowding of many into a small space, even in health, but more especially in a state of disease, as in hospitals, &c. ; or by the presence of only a very few in the same apartment, if their ailments be attended by copious discharges, as in puerperal and dysenteric cases, &c. ; and this air may infect those who breathe it in a state of predisposition, with fever, dysentery, &c. ; persons thus infected, communicating the disease to others similarly predisposed, and under the circumstances about to be stated (§ 18. 2d.). Thus I have seen puerperal fever generated in the wards of a lying-in-hospital, from the air having become vitiated by the discharges ; and nearly all the females, who have been exposed to the action of the contaminated air soon after delivery, affected by it ; the disease being, moreover, conveyed from one patient to another by means of the accoucheur. Foul and phagedenic ulceration, hospital gangrene, erysipelas, dysentery, inflammation of veins, &c. may also be produced, and become even epidemic to a certain extent, in this way.

18. 2d. Disease may take place sporadically, or from local causes, and, owing to various circumstances, acting either in close succession or coëtaneously, the circulating and secreted fluids, and even the soft solids, may be so changed during its course, as to emit an effluvia, contaminating the surrounding air, and thereby infecting many of those who breathe this air in a sufficiently contaminated state ; and thus it will be propagated to several, and from those to others — especially under favourable circumstances of temperature, humidity, electrical conditions, and stillness of the air, and of predisposition on the part of those who come within the focus of infection. This disease may become *infectious and epidemic*, aided by the constitution of the air and other circumstances ; and, after a time, cease and entirely disappear, with the circumstances which combined to propagate it.

19. 3d. A person may be either infected in the manner now stated, or seized by a malady which always evinces infectious properties under circumstances favourable to their development, as typhoid or adynamic fevers ; or by one obviously contagious, and propagated by a palpable virus, as small pox, &c. ; and be removed to a district where the physical conditions, aerial and terrestrial, as well as the states and manners of the inhabitants, favour its spread to others ; or the morbid miasm or matter may be conveyed, by means of some inanimate substance imbued with it, to a distant place thus circumstanced, and the disease be there propagated for a time, then subside, entirely disappear, or again break out, according to the concurrence or disappearance of one or more of the causes aiding in its diffusion. In these cases, the disease becomes epidemic from re-

36. *e.* The appearance of swarms of insects has been likewise considered as a forerunner of epidemics. After mild and open winters, when the cold has not been sufficient to destroy the eggs and larvæ of insects; and during moist and warm springs and summers, when warmth, moisture, and animal decay have contributed to their extraordinary generation; various species of both insects and reptiles have sometimes become so numerous, especially in low and humid districts, as to destroy the vegetable productions, to occa-

with them or increasing their activity. Those "prevailing or minor epidemic diseases," which these writers (see Dr. HANCOCK, in *Cycl. of Pract. Med.* vol. ii. p. 82.) have viewed, not merely as the forerunners of pestilence, but as convertible into it, must be either epidemic or endemic, otherwise they cannot be said to prevail. If the former, which the writer just referred to admits, where are the facts? — Can they bear scrutiny? None have been adduced that can stand the test. If the latter, the circumstance might be expected, *a priori*, occasionally to occur, and is no proof either of the convertibility of the endemic into an epidemic pestilence, or of the absence of infection. The distemper to which this statement is most applicable, and regarding which it has been especially made, is yellow fever, as it requires a certain concurrence of causes for its development, especially in temperate climates, which causes are chiefly and commonly productive of endemic fevers. Those causes are also the principal predisposing and concurrent agents in the diffusion of the infection of yellow fever, which thereby attacks a large proportion of those who might otherwise have been seized by the endemic maladies — the predisposition to infection, occasioned by those causes, favouring an attack of the pestilential epidemic, which thereby takes the place of the endemic disease. Can it be a matter of surprise, or should it not rather be expected — (*a*) upon the breaking out of epidemic yellow fever, which requires a high range of atmospheric warmth for its existence, and which, therefore, can occur beyond the tropics only at particular seasons, which are also those of remittents, that these latter or other endemic diseases should prevail? — (*b*) or, after great numbers have left the place where it has appeared, and the population is thereby greatly reduced; and when three fourths, or even more, of those who remained are attacked by it, as in the epidemics in the south of Spain; that the endemic diseases that prevailed, and which generally do prevail, at these seasons, should then not be heard of, or entirely disappear? — (*c*) or that, when the inhabitants who had departed have returned, and seeing that an attack of one disease does not necessarily preclude an attack of a different disease, remittents and other endemic disorders should reappear to a greater or less extent, according to the intensity and combination of causes producing them, after the pestilential epidemic has ceased? A careful investigation shows that the phenomena connected with this and other pestilences are actually such as may be inferred *a priori*, conformably with the doctrine which imputes them, viz. plague, yellow fever, and pestilential cholera — the chief pestilential epidemics with which we are acquainted — to infection.

The fourth and last statement of the non-infectionists, to which I shall here allude, is, that "no pestilential epidemic is one form of disease" (*Op. cit.* p. 82.), or of unvarying type; and they adduce this as an argument of such epidemic being an aggravated form of the diseases endemic to the place in which it breaks out. But what is the foundation for this statement? Actually none: for however much the pestilences just enumerated may vary in grade and severity, they present, individually, such speciality of features, wherever they are observed, as readily enables the well-educated, the careful, or the candid observer, to distinguish them from diseases which approach them the nearest in character; and are as unvarying as small-pox, measles, or scarlet fever — if, indeed, they be not much more so. We see these latter maladies vary in severity, but they still preserve the same specific features; so do the pestilences in question. We, moreover, see the infections of those familiar and domestic diseases very limited, or scarcely at all diffusing themselves, at certain times and seasons; and, at others, spreading rapidly, generally, and in severe forms; — the same is also observed in respect of plague, yellow fever, and pestilential cholera. The principal difference between the epidemic manifestations of these two classes of distempers is in the frequency and the seasons of their appearance; and this is owing to the nature of the causes concurring to aid the diffusion of their respective infections; and without which aid they could not prevail generally, or become epidemic.

sion scarcity, and, by the decay of their exuviae and dead bodies, to increase the local sources of diseases. They have thus contributed to the causation of an epidemic constitution, and, perhaps, in some instances, have directly produced disease. In such cases, they have either preceded or attended the commencement of the epidemic. The common insects of a country have been said to have disappeared during the prevalence of pestilence. If this have occurred, it may be referred to the operation of the same cause to which the disappearance of, or death of, birds was imputed (§ 13.). But the non-infectionists, who have endeavoured to torture an argument in favour of their views out of the latter circumstance, have not ventured to affirm, as they did in respect of the disappearance of birds, than an unusual absence of insects or reptiles has been ever remarked as a forerunner of pestilence.

37. *f.* As to the influence of comets, meteors, earthquakes, the breaking out of volcanoes, &c. in causing epidemics, or even in indicating their approach, there is not the least evidence, notwithstanding NOAH WEBSTER'S labours to demonstrate it. Coincidence may have been sometimes remarked: but it would require a tolerably uniform antecedence of the former in respect of the latter, to show any relation between them, either as cause and effect, or as concurrent results of one general or pervading cause.

38. III. NOTICES OF SOME EPIDEMIC CONSTITUTIONS OF AUTHORS. — In illustration of what has been already advanced, I will take a brief view of some epidemics, and the causes to which they have been chiefly imputed by those who have recorded them. Epidemics and pestilences of recent occurrence, as well as some of very early date, are referred to in other and more appropriate places. RAMAZZINI records, that the years from 1689 to 1694 were wet, the winters mild, and inundations frequent; and that periodic fevers of an unfavourable kind, and diseases of the bowels, were epidemic; which he attributes chiefly to the irregularity of the seasons, and to the failure of the crops. But these were manifestly only a part of the elements which contributed to the causation of these maladies; the warmth of the climate, the great quantity of rain, and the frequent inundations, with their more direct results, being equally, if not much more, powerful agents. BAGLIVI describes the epidemic constitution of 1703 to 1705, and imputes it chiefly to the seasons, which were mild and rainy in winter and spring, and dry in summer and autumn. Earthquakes were frequently felt during these three years, in the States of the Church; and caused great alarm in the minds of the inhabitants, contributing thereby to the prevalence of disease. He states, that apoplexies and sudden deaths were very frequent; and that they had been also prevalent during 1694 and 1695, throughout Italy. Although he attributes them chiefly to irregularity of the seasons, it is more than probable that the wars, and the attendant evils, which devastated that country during these years, were equally concerned in their production. CORUGNO and SARCONI have described an epidemic, which was very fatal in Naples in 1764, which followed irregularity of seasons, and a scarcity of grain; and which appeared

first among the poor, presenting the various malignant forms of continued and remittent fever. Bleeding, emetics, purgatives, bark, opium, &c. were principally resorted to, but the mortality amounted to nearly one half of those affected. The intermittent, and subsequently the remittent, character which the epidemic assumed during its early progress, proved that the state of the seasons, and the abundant sources of malaria, which existed at the time, were concerned in its production: but the great malignity, with tendency to dissolution, in the fluids and soft solids, which characterised its advanced progress, evinced the operation of additional agents; and these were sufficiently apparent in the wretchedness of the lower classes, the bad quality of the grain, in the want of cleanliness and the general inattention to infection, excepting in the religious houses, which escaped.

39. M. FODÉRÉ refers to the transactions of the physicians of Berlin, Augsbourg, Breslau, Presbourg, and Laybach, to show that the seasons were not the chief causes of the epidemic constitutions they describe. Indeed, at numerous periods, as well as at these, the seasons have been remarkably irregular, without disease becoming epidemic, unless where *endemic* sources have been very much increased by such irregularity, or where the evils of war, or scarcity, or some other element of an epidemic constitution, have been superadded. When diseases have prevailed, they have not always been influenced by the state of the weather and seasons alone, more especially when they have possessed infectious properties. SYDENHAM, although he once conceived that the epidemics of this climate could be accounted for by means of the sensible states of the air, subsequently confessed that they depended less upon these states than upon something in this fluid that could not be ascertained; a more extensive observation having proved the inaccuracy of his former opinion, and confirmed the inference at which HIPPOCRATES had arrived. GEORGEY and others attribute the adynamic and infectious fevers, dysentery, and scurvy, which became epidemic in Paris and the surrounding districts in 1709, to the very severe winter and spring of that year. But a stricter examination has shown that much more was owing to the scarcity of provisions, to their increased price from the imposts of a disastrous war, to the oppression and poverty of the lower classes, to the want of cleanliness, and more particularly to infection favoured by these circumstances, by the state of society and manners, and by inattention to ventilation, &c., than to the severity of the seasons, to which they had been imputed; this co-operation of the elements of an epidemic constitution protracting as well as extending the prevalence of these maladies, as might have been expected, *a priori*, during three years, and for some time after certain of these elements had begun to disappear. In proof of the accuracy of this view of the matter, I may add, that the early months of 1716 were equally severe in Paris, and yet no epidemic occurred; for the principal causes which came into operation in 1709 did not then exist. In 1726, the winter and spring, in the same part of France, were very cold and wet, and grain somewhat scarce; but there was little increase of disease, — scurvy being, as it always was during the

preceding century and the early part of the last, one of the most common maladies of that country. But in 1740, a similar severity of these seasons existed, and was aided by the evils of war, by a much greater scarcity, amounting to famine in many places, and by infection, with the rest of the causes just enumerated; and the results were such as the well-informed pathologist might have inferred from this combination of agents, more especially when acting upon a population physically and morally constituted and circumstanced as the French of that period were: these results being infectious, adynamic, and malignant fever, dysentery, diarrhoea, and scurvy. Cold and wet seasons, thick fogs, and winds that have passed over marshy and woody countries, are often productive of epidemic catarrh, hooping cough, asthma, throat, bronchitis, rheumatism, &c., especially among children, aged persons, and females; and as additional agents come into operation — a scarcity, emanations from animal bodies, exertion, or whatever depresses the powers of life — so the character of the epidemic changes, and the maladies above enumerated, or the exanthemata, supervene, and spread widely.

40. The malignant remittent fevers that raged in the summer and autumn of 1652, in Copenhagen (BARTHOLIN); of 1657, in London (WILLIS); of 1669, in Leyden (SYLVIVS DE LA BEE); of 1691, in various parts of Holland (DEKKER); of 1684, in Helmstadt (SCHULHAMMER); of 1685, in Rome (LANCISI); and of 1737, in Bremen (HANN); and which presented somewhat median characters, with the variation in the circumstances producing them, were very generally imputed to the epidemic constitution of the seasons, by the authors just named. But the evidence they have themselves furnished of the state of the antecedent seasons, and of the great heat and protracted drought following inundations, and the exposing of places generally covered by water, together with various concurrent and subordinate circumstances, satisfactorily accounts for these epidemics. These cities were, for a time, owing to these causes, similarly circumstanced to places within the tropics surrounded by the sources of endemic diseases; and consequently the prevailing maladies were, in the most prominent features, the same as those which are common to such places, or which attack unseasoned Europeans visiting them. This was manifestly the case, on these occasions, as regards Copenhagen, Leyden, and other parts of Holland and Rome. London, in the middle of the seventeenth century, was still surrounded by marshes and low grounds on nearly three of its sides. These endemic sources, during very hot summer and autumns, particularly when these followed immediately upon wet seasons or inundations, always occasioned periodical and continued fevers, dysentery, &c.; and, aided by a crowded population, want of cleanliness and ventilation, the manners of the lower classes, by moist and corrupt states of the air, and possibly by certain electric conditions, favoured not only the generation of the more common infectious fevers, but also the development and propagation of foreign infections, as that of plague, when introduced.

41. The fever characterised by disorganisation of the digestive mucous surface, — the *Morbus Febrilis*, of FODÉRÉ and others; the *Fever* of

chali-epidemics, of ARNOLD; the *Adenomeningeal* Fever, of PINEL; and the *Gastric*, the *Catarrhal*, the *Mesenteric*, &c., of various authors, — had been observed in an epidemic form, on various occasions, somewhat similar to that in which it occurred in Gottingen in 1760 and 1761, when it was accurately observed and described by RÖDERER and WAOLER. It then assumed a very severe form, modified into the remittent, dysenteric, nervous, adynamic, and infectious states by the circumstances which concurred in producing it. These years, as well as those immediately preceding them, were very wet, and, moreover, the epoch of scarcity and war, during which the city was besieged. Hence it cannot be a matter of surprise that agues, remittents, dysentery, scurvy; gastric, adynamic, and typhoid fevers, &c.; should have successively appeared; or that either should have successively predominated; or that a fever of a mixed or complicated character, and very severe form, should have prevailed during the co-operation of these energetic elements or agents of an epidemic constitution. My limits will not permit me to take a further view of the epidemic constitutions of authors. Those described more recently by HUXHAM, HERBERDEN, SIMS, &c. are of easy access to most physicians, and furnish merely illustrations of what has been already advanced. The epidemics which have occurred during the last half century in America and the south of Spain are particularly reviewed in the article on YELLOW FEVER. I shall, therefore, only advert to certain topics connected with them, and state such inferences as observation and study suggest.

42. Many of the writers who have either seen or given an account of the epidemic occurrences of yellow fever, as DEVIÈZE, JACKSON, FERGUSON, &c. have insisted particularly upon the agency of miasms extricated, by a powerful sun, from the soil, and of the electrical states of the atmosphere, in their causation. It is very probable that such miasms emanate from rich deep soils abounding with the elements of vegetable and animal organisation and life, during very hot seasons, and when they are fully exposed to the sun's rays; it is also probable that vicissitudes in the electrical conditions both of the air and of the bodies placed on the earth's surface occasionally take place; and it is possible that both these agencies may be occasionally coincident, or co-operate in certain localities. But we possess no evidence, even granting their existence, that they are capable of producing the effects ascribed to them. Their existence, however, is only a matter of inference from certain phenomena which cannot sometimes be otherwise satisfactorily explained, and not of demonstration; and although the proofs of the injurious operation of the former of these are more convincing than those yet furnished in respect of the latter, yet facts are still wanting to render the evidence in support of it complete. After a personal examination of many of the localities both within and without the tropics, to which certain pestilential epidemics have been altogether ascribed by many writers, I cannot come to the conclusion, that, under circumstances of the kind just stated, these localities could ever, of themselves, produce the very general and fatal effects characterising these pestilences; that even the warmest sun, the stillest

atmosphere, and the longest absence of thunderstorms, which observation has ever shown to have occurred — the conditions so strongly insisted upon by these writers, — could generate from them miasms of so noxious a nature as to occasion, by their unaided action, such pestilential epidemics as have occurred in various parts of America, and the south of Spain. That endemic sources of disease, especially the situations alluded to, give out miasms when long acted on by a hot sun; that these miasms often become concentrated in a humid and calm atmosphere, or after autumnal showers; and occasionally are aided in their operation upon the human frame by the electrical states of the air; may be admitted; for an increased prevalence, and a more severe form, of fever are often observed in these situations, on such occasions. But after the most careful consideration long bestowed on the subject, and after a patient enquiry into the facts recorded, I cannot believe that these exhalations are the only, or always the chief, cause of these epidemics. That infection is a primary agent in the propagation of the disease, and that an infectious miasm is generated by the sick, cannot, I think, be denied by the candid enquirer into *all* the facts connected with the subject. But I believe that, without the physical changes and the consequent emanations alluded to, or some other concurrent causes, the infection would not extend through the community, as these emanations, floating in the air, dispose the system to be impressed by the infectious principle, or otherwise aid its operation; or, in circumstances where the terrestrial exhalations have already produced much disease, the miasms from the sick become a superadded cause, increasing the severity of the epidemic as well as the rapidity and universality of its spread. That an infectious principle is concerned thus primarily or consecutively in the production and propagation of pestilential epidemics, according as it may be introduced from some other quarter, or generated by those first affected, appears fully established by numerous circumstances independently of various considerations derived from the nature of the particular epidemic, and of the antecedent and consecutive disorders, especially those endemic to the place in which it breaks out. Of these considerations, the following seem not the least important.

43. *a.* The localities to which certain epidemics, as yellow fever, are chiefly confined, have been, for many successive years, circumstanced, in respect of season and weather, similarly to the periods in which that disease has been most destructive; and yet the common endemic of the country only has been observed, in the form it usually puts on in that particular season. — *b.* True, or epidemic yellow fever, differs not merely in degree, but also most essentially and in kind, from the endemic fever of these localities; consequently the former is not merely an aggravated state of the latter, — the one disease is as different from the other as small-pox is from measles. — *c.* On all occasions on which the non-infectious properties of yellow fever have been argued for, the bilious remittent or severer forms of endemic fever of low situations in warm countries, and the ardent or seasoning fever of Europeans who have lately arrived within the tropics, have been assumed as identical with that malady. This error has arisen

from the occasionally yellow appearance of the skin in the bilious remittent, and the dark or coffee ground vomiting sometimes seen before death in it and in the ardent fever. But these changes are not the same, even in the cases where they are most prominent, as those in the true yellow fever; and, as shown in another place, are owing to very different pathological states. — *d.* That the very essential difference between these diseases indicates their different origins; and a speciality of form in the various quarters where the epidemic malady has been observed, equally denotes its source in a specific cause. — *e.* That diseases which arise from terrestrial exhalations present numerous modifications, forms, and types; have all a tendency to relapse, or to return in some form or other, upon exposure to the exciting cause; and always occasion marked derangement, and ultimately organic change, of the liver, spleen, or pancreas, or one, or all: whereas the true or epidemic yellow fever, independently of the most irrefragable proofs of infection, possesses all the attributes of infectious diseases; attacks the frame only once, as shown by the most unquestionable evidence, British and foreign, derived from the epidemics of Spain and America; and leaves no organic changes of these viscera as sequelæ, even of its most malignant state. — The manner in which the very different diseases now referred to have been confounded the one with the other, by those espousing the non-infectious nature of yellow fever, whether from ignorance or unfairness, has led to the most serious consequences to the community; has misled the inexperienced, mystified the subjects in dispute, furnished grounds for a special pleading sort of argumentation, and, as will be seen in the articles FEVER and INFECTION, endangered the safety of fleets and armies, and even of kingdoms.

44. IV. GENERAL INFERENCES. — *a.* *Civilisation* exerts a most decided influence in diminishing the frequency and mortality of epidemics, especially those that are fatal or pestilential, as shown by their history at different epochs, and in different countries holding various grades in the scale of civilisation, — an amelioration evidently due — *α.* to a better cultivation of the soil; to more extensive commerce, and, consequently, to the less frequent occurrence of great scarcity, and to the improved diet and circumstances of the lower classes in most European countries, in modern times; — *β.* to a favourable change in the manners and habits of the middle and lower classes, particularly in regard to cleanliness, social intercourse, and domestic arrangements; and to better ventilated and improved dwellings; *γ.* — to superior care in the separation and treatment of the affected; and to stricter measures for the prevention and counteraction of infection. Owing chiefly to neglect of these circumstances, the lowest classes, and the most wretched amongst these classes, are most frequently attacked — the mortality being also the greatest among them in proportion to the number affected.

45. *b.* *Different ages* are not equally affected by epidemics. The exanthematous fevers and hooping cough are most prevalent among, and fatal to, infants and children; influenza, to the aged and debilitated. Continued fevers, in adynamic and malignant forms, attack chiefly per-

sons from fifteen to fifty; but are less fatal to them, than to those of earlier or later ages. Plague most frequently seizes adult persons of early or middle life, and generally males in somewhat greater numbers than females, — probably owing, in part, to more exposure, at this age, and of the male sex, to the predisposing causes and to infection. Yellow fever attacks chiefly the young and middle-aged; but spares only those who have passed through it in former epidemics. Pestilential cholera, on the other hand, does not so often attack persons about puberty and the meridian of life, as those that are aged and exhausted; and is usually more fatal in the latter than the former. When an increased activity of endemic causes produces epidemic fevers, young children often suffer very remarkably; and the malady assumes in them, gastric, choleric, or dysenteric forms.

46. *c.* *The mortality from diseases*, when they first appear in an epidemic form, is usually very great; but diminishes with the frequency of their recurrence, especially those which have sprung up since the early history of our science, and which are of a contagious or infectious nature. This has been the case with hooping cough, measles, syphilis, small-pox, and may probably be so with pestilential cholera. It is not manifest with regard to pestilences appearing after long intervals: but these are usually more fatal at their commencement, or during the early course, and less so at their decline. The first introduction of small-pox, syphilis, &c. among savage tribes, has been as destructive as the pestilences that occurred in the middle ages. This can be explained only as briefly stated above (§ 30.).

47. *d.* *As to the influence of epidemics on population*, it may be inferred, that the diminished prevalence of certain maladies, which formerly reigned epidemically, is in some respects compensated by the greater frequency of other diseases, formerly of rarer occurrence; or the appearance of some previously but little or not at all known. — Since the introduction of vaccination, small-pox has rarely prevailed to a great or fatal extent; but scarlatina, measles, croup, inflammations of the bronchi and lungs, and cerebral affections, have evidently increased. The benefits, therefore, of vaccination may be said to be somewhat overrated. It is remarked by M. SAY (*Cours complet de Economie Politique*, t. iv. p. 385.), "When we hear it said, that by saving a hundred thousand lives, vaccination has added a hundred thousand souls to the population, we may smile at the error whilst we applaud the discovery." M. LEROUX has deduced from his researches, that in populous countries, and particularly in large towns and cities, and in the lower classes, small-pox is fully replaced by an increase of other dangerous diseases; but in districts furnishing sufficient subsistence and scope for increased population, and in the higher classes, this compensation is hardly or but slightly observed. Indeed, all preservative measures against the diseases of infancy act similarly, — in suppressing one cause of death, we more or less increase the activity of the rest.

48. *β.* In civilised countries, epidemics, although attended by a very great mortality, are

temporarily diminish the population; for it is uniformly observed, that the void is filled up, during the next few years, by a much greater annual average of marriages and births, and by an influx of strangers from other parts, the mortality leaving more abundant means of subsistence for those who have escaped. Destructive epidemics are most frequent in low situations and crowded cities; and epidemics of a slighter kind and commoner form often occur in these and other districts abounding with malaria; and, whether they be aggravated forms of the usual endemics, or infectious fevers, &c., they all indirectly tend to augment the number of marriages and births, whilst they increase the deaths and diminish the mean duration of life. These results are evidently owing to the more abundant means of sustenance and employment furnished by these places, than by mountainous and barren districts; and to the influx from more healthy parts; the excess of deaths over births being supplied from the latter source. The following statistic return, furnished by M. Bossi, prefect of the department of the Ais, in France, and which he has divided into four zones, according to the nature of the locality, illustrates this statement, and shows—

	1 Death annually to Inhab.	1 Marr. annually to Inhab.	1 Birth annually to Inhab.
In the hilly districts -	38.3	179	34.8
Along banks of rivers, &c.	26.6	145	28.8
In cultivated grounds -	24.6	133	27.5
In marshy places, &c. -	20.8	107	26.1

(For the Prevention of Epidemics, see art. ENDEMIC INFLUENCE (§ 20.) and INFECTION.)

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and, in one at least, there, are hopes of recovery. Tumour in this region may be occasioned by great distension of the gall-bladder with bile, from obstruction of the common duct; but, in this case, it is more circumscribed and distinct than in abscess of the liver, is unattended by any appearance of inflammation of the external parietes, is often pyriform, and situated at the lower part of the region, and to the right, fluctuates obscurely, and often disappears after appropriate purgatives. Swelling of this part, in lean persons, may also be occasioned by enlarged or scirrhus pancreas, more rarely by distension of the duodenum, and not so often as is supposed by tumours about the pylorus, because, when they are sufficiently large to distend this region, they generally draw this extremity of the stomach below, and to the right of it. Fulness of the epigastrium is seldom occasioned by distension of the colon with flatus, or accumulated feces, or by enlarged spleen, or by the effusion of fluid, until after the swelling has appeared to a very considerable extent in the adjoining regions; and then it is greatest at the lower part.

4. iii. *Pulsation in the Epigastrium* arises from the following causes:—*a.* Nervous susceptibility and irritation;—*b.* Inflammation of the aorta;—*c.* Aneurism of the aorta, coeliac, or superior mesenteric artery;—*d.* Adhesion of the pericardium to the heart;—*e.* Tumours at the root of the mesentery;—*f.* Tumours of the stomach, and scirrhus of the pylorus;—*g.* Enlargement of the pancreas;—*h.* Hypertrophy of the heart, particularly of its right side;—*i.* Enlargement of the vena cava inferior;—*k.* Hepatisation of the lower portion of the lungs;—*l.* Enlargement of, or abscess in, the liver. On the chief of these I shall offer a few remarks.

5. *a.* *Nervous pulsation* of the aorta and coeliac arteries is not infrequent. It comes on suddenly; and often continues long, chiefly in hysterical females, and hypochondriacal men, whose nervous system and digestive organs have been long debilitated or otherwise disordered. It is generally stronger in the morning than in the evening. Dr. BAILLIE met with a case that remained for many years. Dr. VALENTINE MOTT states that of a lady, in whom it occurred as a certain sign of pregnancy; but usually left her after the third month. I have seen it so violent that the pulsation could be observed through the dress, and the patient insisted it could be heard at some distance. (See AORTA, § 2. *et seq.*)

6. *b.* *Aneurisms* of the aorta and large arteries may occasion pulsation in this region; but they frequently have proved fatal without this symptom being noticed; and, where it has been remarked, the pulsation has not been strong. Mr. A. BURNS states, that aneurism of the coeliac artery is rarely a cause of this pulsation; and that, in about twenty cases of pulsating tumours in the region of this artery, not one of them turned out, upon dissection, to be disease of this or any other artery. (See AORTA, § 44.)

7. *c.* *Adhesion* of the pericardium to the heart, is sometimes a cause of pulsation; and that it should be, is obvious. Dr. MOTT thinks it one of the most frequent causes. Dr. HOPK describes the pulsation as peculiar, and distinguishes it by the epithets jogging or trembling; it is synchronous with the sounds of the heart. (See PERICARDIUM.)

8. *d.* *Tumours*, from enlargement of the glands at the root, or in the duplicatures, of the mesentery, are productive of pulsation when they become considerable and press upon the aorta, or coeliac or superior mesenteric artery. A case of this description is described by Dr. ALBERS. In a person whom I attended some time ago, and who had become very emaciated, a distinct pulsation in the umbilical region arose from this cause. Indeed, the pulsation, when thus produced, is rarely so high up as the epigastrium, and is sometimes felt in both regions.

9. *e.* *Tumours* developed in the stomach, or attached to its villous coat, and scirrhus of the pylorus, have been noticed, by BAILLIE, BURNS, MONRO, FRANCIS, and V. MOTT, as occasionally attended by pulsation. I cannot, however, agree with the last writer, in thinking that “the obstruction to the free passage of blood through the hardened” and enlarged parts occasions this symptom; but believe that, when they press upon or come in contact with, the large arteries, especially the aorta, the pulsation is necessarily propagated to the external situation in which it is felt.

10. *f.* *Enlargement of the pancreas*, or of the liver, is probably more frequently a cause of epigastric pulsation, than tumours connected with the stomach; the enlarged and indurated viscus transmitting the pulsation of the aorta, as just stated. This cause has been noticed by BURNS, WARREN, V. MOTT, PORTAL, and myself. Dr. SEWELL considers that an enlarged pancreas is always accompanied with pulsation at the epigastrium. I think that such is not the case; and that, generally, the disease must be far advanced before this symptom attends it.

11. *g.* Of the other causes of pulsation at the epigastrium, I need only remark, that cases, in which it has been occasioned by enlargement of the vena cava, are mentioned by SENAC and A. BURNS. Dr. PEMBERTON thinks that the fluttering, sometimes felt at this region, is produced by congestion of the vena portarum, and the undulation communicated to it. Pulsation from hepatisation of the lower margin of the lungs, has been observed by A. BURNS and others. BERTIN, BOUILLAUD, and myself have noticed this as a symptom of inflammation of the aorta. (See art. AORTA—*Inflam. of.*) Its connection with hypertrophy of the heart, particularly of its right side, requires no remark.

12. *iv.* *In examining the epigastric region*, pressure should at first be very gentle, gradually increased, and be made in various directions. When the heart is diseased, it should be directed under the anterior cartilages of the upper false ribs; and, according to the situation of other organs or parts suspected of disorder, the pressure ought to be directed. When the patient almost involuntarily throws the muscles underneath into action, upon commencing the examination, acute disease of some part or other may be suspected. The state of the surface, in respect of moisture, temperature, softness, colour, &c.; and the sensibility, the elasticity, the degree of depression, fulness, pulsation, &c. of this region; are equally deserving of notice. In difficult or doubtful cases, *percussion*, particularly if aided by PIGNY's pleximeter, will be of service in giving information as to the presence of air, or of effused fluids, or of enlargement of the subjacent viscera.

Mal of French writers—are very varied in character. They often precede, for months or years, the full evolution of the severe form of the disease. Generally they consist of loss of consciousness, and slight rigidity, spasm, or convulsions of a few muscles, or of one or more limbs, which continue only one or two minutes. In still slighter cases, the patient is seized with vertigo, loss of consciousness and sensation, and muscular collapse or slight spasm of a few muscles, and is, after some seconds, completely restored. In some instances, the eyes of the patient become fixed and vacant; he attempts to articulate, but is unable; loses consciousness for a very few seconds; and, upon recovering it, takes up the thread of discourse which the seizure may have interrupted, and endeavours to conceal the occurrence. Occasionally the slight seizures very nearly approximate those of hysteria, or are associated with several hysterical symptoms. In many instances, the patient does not fall to the ground, although he may have been standing at the time of attack; and in others, consciousness is not entirely abolished, the patient retaining a vague recollection of what passed in the seizure, upon recovery from it, as after temporary delirium or dreaming. These slighter fits may recur either frequently or very rarely, but they commonly return after short intervals, and sometimes as often as several times a day.

14. *D. Of the intervals between the paroxysms.*—After the fit, the patient complains of lassitude, of soreness of the limbs and of parts that have been injured, and is pale, sad, and fearful of its return. In some severe cases, the face is studded, particularly about the eyes and temples, with numerous small ecchymoses arising from minute extravasations from the extreme capillaries of the *rete mucosum* during the congestion to which they had been subjected in the paroxysm. In rare cases vomiting or purging of blood is observed, owing most probably to sanguineous exhalation from the congested capillaries of the digestive mucous surface. Sometimes paralysis of a limb, more or less complete, or strabismus, or even irregular movements or convulsions, or various hallucinations follow the severer attacks, and continue several hours, or even days. In a case to which I was very recently called, paralysis of the left arm, and severe pain in the right eye-ball and temple, continued after the fit—the former for some hours, the latter for several days. Deafness, watchfulness, terrifying dreams, slight or passing delirium, occasional convulsive movements (*Αρετæus*, &c.), and fits of absence or forgetfulness, often afflict the patient, either for some time after an attack, or during the whole interval. Between the complete paroxysms, as well as before their evolution, the slight seizures described above (§. 13.) in one or other of their forms—sometimes so slight as to amount merely to vertigo with momentary loss of consciousness, or spasm of some part—the *Vertige Epileptique* of French writers, are very common. Various signs of mental alienation often appear, which generally become more and more remarkable after successive, more frequent, or severer attacks, until insanity is the result. Epileptics commonly experience, during the intervals, various dyspeptic disorders; but their appetites are usually very keen, and seldom duly restrained. *J. Frank* states, that he has seen persons suffer

little disturbance after a fit, and others display increased activity of both mind and body, until its approaching return; but this is a rare exception; the great majority, even of those who suffer the least, being incapable of devoting themselves to any undertaking with attention and perseverance.

15. II. CONSEQUENCES AND TERMINATIONS.—Persons long afflicted by the disease, gradually acquire a peculiar physiognomy, owing to the repeated distension of the vessels of the head, and to the frequent spastic and convulsive actions of the muscles of the face during the paroxysm. This is particularly the case in such as are addicted to masturbation—a baneful practice which is common among epileptics, and, indeed a principal cause of their malady. This alteration of the features has been noticed by *Arætaus*, who mentions their pale or leaden complexion, and their languid dejected look; but *Dumas* and *Esquirol* have described it most accurately. The individual features become coarse; the lips thick; the lower eyelids swollen; the eyes unsteady, full, and prominent; the look vacant; the pupils dilated; the cheeks pale; the finest countenances plain; the muscles of the face subject to twitchings, or slight convulsive movements; the arms and limbs thinner than the rest of the body; and the gait peculiar. The functions of organic life likewise languish, obesity or emaciation being a common result. When the disease appears or continues after puberty, or the fits return frequently, the mind as well as the bodily powers become greatly impaired. These consequences are, however, in some respects connected with the states of nervous function, and the circulation within the head directly producing the seizures; the pathological conditions, which, at their commencement, and in slighter degrees, occasion the epileptic seizure, giving rise, in their advanced course and heightened grades, to various associated maladies. After the continuance of the disease, the patient is at first listless, incapable of energetic exertion, and sometimes hypochondriacal. He is liable to attacks of stupor, and complains of lassitude, flatulency; of various forms of indigestion, generally attended by a craving appetite; of great torpor of the bowels; of vertigo and tremors, &c. He is subject to deafness, amaurosis, and, in prolonged cases, to irregular muscular contractions, or paralytic tremor, to partial paralysis or complete hemiplegia, to imperfections or even loss of speech, to apoplexy, to melancholy, to partial or complete, or to intermittent or continued insanity, and to mania or idiocy.

16. Notwithstanding that epilepsy seldom passes into the apoplectic state, until after repeated fits, yet both maladies may be associated in the very first seizure. (See § 40.) Insanity and mania, although not generally appearing until after several or many attacks, are by some the most frequent consequences of epilepsy, &c. I believe much more so on the Continent than in this country; whilst apoplexy and paralysis oftener supervene here than there. *Van Swieten* states, that persons who have become insane at an early age, have been generally first epileptics. *Esquirol* has come to a similar conclusion, and my experience confirms it; the seizures, however, having been sometimes of an irregular convulsive kind, rather than those of true epilepsy. 13

this frequent class of cases, the mental faculties are gradually impaired; sensation and memory are weakened, the former being often acute; perception and imagination perverted; various hallucinations generated; and the patient lapses into a state of incurable insanity or imbecility, or passes from the former into the latter. The more severe the fits, the more is this result to be dreaded. Sometimes violent attacks of mania follow the paroxysms. Of 289 epileptics in the Salpêtrière, in 1813, 80 were maniacal, and 56 in various states of mental alienation and imbecility. In 1822, out of 339 cases in the same hospital there were two monomaniacs, 30 maniacs, 34 furious maniacs, 129 insane for some time after the paroxysms, 16 constantly insane, 8 idiotic; 50 upon the whole reasonable, but with impaired memories, and liable to occasional slight delirium, and tendency to insanity; and 60 without aberration of intellect, but susceptible, irascible, capricious, obstinate, and presenting something singular in their characters. As this institution receives chiefly old and severe cases of epilepsy, it furnishes sufficient illustrations of the consequences of this disease. Occasionally the epileptic mania alternates with melancholia and a desire to commit suicide; the mania often preceding the paroxysm: Dr. CHEYNE states that he has known epileptics preserve their intellects to a very old age; but this is only the exception to the general rule, for they seldom live to a great age, or retain their faculties when they reach it.

17. The *duration* of the disease is most uncertain and various, and depends upon numerous circumstances connected with the regimen, habits, and treatment of the patient. Epileptics are most injuriously addicted to the indulgence of the appetite for food, and for the sex, — practices which should as much as possible be guarded against, as tending not merely to counteract the good effects of treatment, but also to induce the unfavourable consequences of the seizures enumerated above. A *favourable* termination is indicated by the fits being slighter, shorter, and more distant. Sometimes a marked crisis occurs — as the return of a suppressed evacuation, particularly the menstrual and hæmorrhoidal fluxes, epistaxis, &c., the reappearance of a repelled eruption, &c. An attack of continued fever has removed the disease, — but very rarely when it has become confirmed. M. ESQUIROL states that in 1814, when typhus fever raged in the Salpêtrière, although upwards of fifty epileptics were attacked by it, and but few died, little or no amelioration was observed in any.

18. A person subject to epileptic fits may die of other diseases, or of a malady proceeding from an increased grade of the same changes, which, in a less degree, occasioned the fits; or of the direct or indirect effects of the repeated seizures; death taking place sometimes in the intervals, but more frequently during the paroxysm or soon afterwards. When it takes place in the interval, it is occasioned by the remote effects of the fits, in connection with the pathological states inducing them — by some one of the diseases consequent upon them (§ 38. *et seq.*). If it occur during or soon after the paroxysms, it is generally owing to an augmented degree of the same changes usually producing them, or to some further alter-

ation directly proceeding from these changes; either *apoplexy* caused by excessive congestion within the head, or by extravasation of blood in some situation, or by effusion of serum in the ventricles or between the membranes of the brain; or *asphyxy* occasioned by similar lesions affecting the medulla oblongata and upper part of the spinal chord, being the immediate cause of dissolution. It has been supposed, that suffocation often occurs in the paroxysm, owing to the position of the patient, or of the clothes around him when in bed. But this, I believe, rarely takes place; and when suffocation, or rather asphyxy, is met with, it is caused chiefly, if not altogether, by some one of the changes just stated.

19. III. CAUSES. — i. *Predisponent*. — *Hereditary disposition* is a remarkable predisposing cause of epilepsy, notwithstanding this kind of influence has been disputed in respect of it. But although the father or mother of the patient may never have had an attack, either of the grand-parents, or uncles, or aunts, may have been subject to it. ZACUTUS LUSITANUS (*Prax. ad Mir.* l. i. obs. 36.) mentions the case of an epileptic man who had eight children and three grandchildren afflicted by the disease. STAHL (*De Hered. Dispos. ad var. Affect.* Halæ, 1706, p. 48.) and REININGER adduce instances of the whole of the members of a family being attacked by it at the period of puberty. BOERHAAVE (*Aphorisms*, 1075.) remarks, that, like several other hereditary maladies, it often passes over alternate generations; and he adduces an instance (*Prax. Med.* t. v. p. 30.) in which all the children of an epileptic father died of it. I had, in 1820, a brother and sister some time under my care, who inherited the disease from their father, and they had two other brothers and one sister also subject to it — in all five. The fits appeared in all of them about the period of puberty; and one of the brothers died about the age of forty from apoplexy, complicated with the seizure. MM. BOUCHER and CASAUVIEILH state that in 110 patients, respecting whom they had made the enquiry, 31 were hereditary cases; and M. ESQUIROL found, that in 321 cases of epileptic insanity, 105 were descended from either epileptic or insane parents. Predisposition is often connected with *congenital formation*. I have seen the disease in several children, whose heads were of an oblique or diamond shape, or otherwise ill-formed; one side being more elevated than the other, and either side advancing or receding. Peculiarity of constitution, or *idiosyncrasy*, seems to predispose to it, as well as the epochs of *childhood* and *puberty*, at which periods the nervous and muscular systems are endowed with their greatest sum of sensibility and irritability, and the whole frame with great susceptibility. Cases, however, often occur, in which these properties are rather diminished than increased. After puberty is fully attained, the disposition to the disease is greatly lessened.

20. The influence of *sex* is not remarkable; and is not manifested until after the second dentition. According to ESQUIROL and FOVILLE, females are more subject to the disease after this epoch than males. At the end of 1813, 162 male epileptics were in the Bicêtre, and 289 female cases in the Salpêtrière. J. FRANK found, that of 75 patients, 40 were females; but he agrees

continued or recurrent; are more irregular in their course; and are accompanied with more or less fever, loss of appetite, and often with thirst; whilst the latter is less frequent, more periodic, and attended by much less disorder of the digestive, circulating, and assimilating functions; the one being an *acute*, the other a *chronic*, malady. — (d) In fine, epileptic seizures may be readily distinguished from all others by — 1st, their commencing with a scream, and sudden and complete loss of sensibility; 2d, the spastic rigidity of the affected muscles in the first stage; 3d, the convulsions being more tetanic than clonic, unless in severe cases complicated with apoplexy; 4th, the foaming at the mouth, distortion of the features, and lividity of the countenance; 5th, the priapism and unconscious discharges; 6th, the injury sustained by the tongue; and 7th, the consequent sopor, or mental aberration. The diagnosis of real from *feigned* epilepsy is considered in the article on *FEIGNING DISEASE*.

54. VIII. PROGNOSIS. — An opinion of the disease should have reference — 1st, to the recurrence of the paroxysms; 2d, to their severity, duration, and the danger to be apprehended; and, 3d, to the nature of the disorder complicated with them. Of epilepsy generally it may be said, even when the simple form, and not very frequent recurrence, of the fits indicate no immediate danger, that few disorders are more intractable, or more liable to contingent complications of a very serious kind. The danger varies materially in the different varieties and states of the disease, and increases as the fits return more frequently, as they become more severe or of longer duration, and as additional disorder of the nervous system associates itself with them. — (a) In the *simple* forms, the cerebral symptoms, preceding and following the fits, are the chief guides in forming a prognosis; but what is known of the causes must also be taken into account. The presence of intense pain, vigilance, delirium, mania, amaurosis, paralytic symptoms, &c., either before or after the seizure, indicate organic lesions of the brain, and an unfavourable form of the disease, usually passing into some one of the complications described above. In cases of this kind, considerable danger is to be apprehended from the paroxysm, especially when there is evident plethora. Hereditary predisposition, severe injuries of the head, and the scrofulous diathesis, although not necessarily indicating immediate danger, are also very unfavourable circumstances.

55. (b) The *sympathetic states*, or those associated with or arising from disease in related organs, are generally less dangerous than the cerebral varieties. Of these forms, the most serious are the *spinal* and *cardiac*; and the least so, the *uterine*, *enteric*, and *stomachic* or *dyspeptic*, but much will depend upon the amount of disorder in the respective organs, and the habits of the patient, particularly as to indulgence of the appetites. When these are under due control, the latter three varieties often terminate favourably. The *uterine* variety sometimes disappears after marriage; but if an attack occurs in the puerperal states, it is attended by much danger.

56. (c) The *complicated varieties* present few chances of complete recovery, especially the *paralytic* and the *insane*. When, however, the paralytic symptoms are slight, or pass away soon

after the fit, recovery should not be despaired of; and the same may be said of the form attended by temporary delirium, or by *delirium tremens*, or by temporary *mania*, or intermitting insanity. M. ESQUIROL states, that epilepsy complicated with continued insanity is never cured. I have seen complete recovery from the *apoplectic* variety; but this is a complication also of great, and often immediate, danger. The *intermediate* form is much less dangerous.

57. (d) The fits usually *recur* most frequently in the cerebral and complicated forms; and next in the spinal and cardiac. They are most rare in the uterine and the nephritic, and in the gastric and hepatic. Dr. CHEYNE thinks that the disease is most inveterate when it is accompanied with chronic cutaneous affections. Addiction to masturbation aggravates and prolongs it, and often causes it to pass into the paralytic and maniacal or insane complications; but, when it has arisen from this most baneful and disgusting practice, and the patient has had resolution enough entirely to relinquish it, a complete cure will often be accomplished. Epileptic seizures from the metastasis of gout or rheumatism, or in persons of the gouty or rheumatic diathesis, may not return, if these diseases fix themselves in the extremities. When the fits arise from the syphilitic infection, a mercurial course will generally remove them permanently. M. CULLERIER has recorded several instances of this.

58. IX. TREATMENT. — i. *Of the Paroxysm*. — The *intention* is to shorten the fit, or render it less severe: but this is not easily accomplished; and the means usually recommended for the purpose, if inappropriately used, may have a very opposite effect; and either render the next seizure more severe, and the interval shorter; or convert what would have been a simple, and by no means serious, paroxysm into a recurring and prolonged seizure, followed by various unfavourable symptoms. — *Bleeding* has been advised in the paroxysm; but, unless in the epileptic convulsions of the puerperal states, or when the fits are attended by very marked plethora, or cerebral congestion, or in a first attack, especially when consequent upon the suppression of some sanguineous evacuation, it should be deferred. Besides, it cannot easily be performed in the convulsive stage of the paroxysm, at which time it is most appropriate. In the just mentioned excepted circumstances, however, I have directed it with great advantage. But in the soporose period of the fit, it should not be resorted to, unless apoplectic symptoms be present. I have seen it, at this stage, cause a return of the paroxysm as soon as sensibility had been partially restored.*

* A gentleman, residing near Portman Square, had been under my care, in the spring of 1833, for articular rheumatism. He soon recovered, and went out of town. Towards the close of the year, whilst in Scotland, he had an epileptic attack; and was bled in the arm, and cupped soon afterwards. This was the second seizure the first having occurred two or three years before. He returned to town immediately after this second attack; and, when I saw him, there appeared no occasion for further vascular depletion; a course of alteratives and stomachic purgatives was therefore directed. Three or four days afterwards, he had a third seizure, and was brought home in the soporose stage of the fit. I did not see him until about two hours afterwards; and then a physician, who had been called in whilst I was sent for, had had him cupped largely! But, soon after the depletion, and as sensibility was returning, the paroxysm

others (F. 186. 212. 423. 845.). It often shortens the fit, or prevents it altogether, when exhibited in enemata shortly before the usual period of accession, as in Formulæ 130. 135—138. 151.

87. *c.* Of animal substances, castor, musk, and ox-gall are most deserving of notice. — *a.* Castor is recommended by ARÆTEUS, CELSUS, PLINY, SERAPION (apud Cæl. Aurel. p. 352.), K. DIGBY (*Experimen. Med.* p. 332.), MOOR (*Pathol. Cerebri*, p. 211.), THOUVENEL (*Sur les Vertus des Subst. Anim. Medicam.* p. 357.), TISSOT, and FOTHERGILL. When unadulterated, and given in full or large doses, it is often of much service; especially in the asthenic, dyspeptic, and uterine varieties; and in the combinations advised in respect of assafoetida and camphor, with which (as well as valerian and musk) it may be conjoined (F. 480. 497. 905.). — *β.* Musk is also beneficial in these varieties, or in the other forms, after evacuations have been prescribed, and in similar combinations to those mentioned with reference to the preceding substance. It is favourably mentioned by FEUERSTEIN, VAN SWIETEN, QUARIN, CULLEN, ACKERMANN, and others. HANNES made a full and successful trial of its efficacy on his own son (See *Nova Acta Nat. Curios.* vol. v. p. 244.). It should, unless intended merely as an adjuvant of other means, be given in much larger doses than usually directed. It may be conjoined with camphor, sulphate of zinc, &c. — *γ.* The bile of various animals, particularly of the ox, bear, and dog, has been noticed by BARTHOLIN, UNZER, QUARIN, and others. Of inspissated ox-gall I have had some experience in this complaint; but have usually directed it in combination chiefly with assafoetida, galbanum, myrrh, aloes, &c. (F. 558. *et seq.*) It is of much service in the states just particularised, and after depletions have been carried far, or to an injurious extent. In a case of this latter description, I am now employing it with very marked advantage.

88. *d.* Cold or salt water bathing has been advised by CELSUS, CÆLIUS AURELIANUS, FLOYER, LENTIN, TISSOT, and HUFELAND; but it requires caution, and attention to its effects. In young persons and delicate females, who have not been accustomed to a plunge bath, the fear or shock of immersion may bring on the seizure: indeed, WIEKARD (*Observ. Med.* Franc. 1775.) and TODE (*Med. Chir. Bibl.* b. i. p. 117.) adduce instances of such an occurrence. The shower-bath, used daily, commencing with tepid water, and gradually reducing the temperature, in cases where the shock may be dreaded, is of much less equivocal benefit; and is, in all the varieties, but in the simple or cerebral forms especially, a very excellent remedy. When it cannot be employed, the patient should daily effuse water from a large sponge over the whole head and occiput.

89. *G.* Numerous substances evincing more of stimulating, than of tonic and antispasmodic, properties have been prescribed, with occasional success; but, in general, in combination with one another, or with medicines producing an astringent or tonic effect. — *a.* — *a.* The oil of hartshorn, or DIPPÉL'S animal oil, was very generally used, both internally and externally, especially during the last century, owing to the recommendations chiefly of DIPPÉL (*Disquisit. de Vitæ Animalis Morbo et Med.* &c. p. 89.), ALBERTI (*De Med. in Motibus Nat. Exacerbatis.* Halæ, 1718.), VATER (*De*

Specificor. Epilep. Sigillatim Olei Animal. Virtutibus. Vitel. 1725.), MAUCHART (*De Oleo Animal. Dippellin.* Frib. 1745.), JUCH, KORTUM, BANG, THOUVENEL, CULLEN, MORAND, and PORTAL. FEUERSTEIN believes that, when it is pure, and not altered by the action of the air, it is often beneficial. ACKERMANN considers it possessed of no small efficacy in the asthenic forms of the disease, particularly those connected with anemia, and languor; but hurtful in the irritable and plethoric states. QUARIN advises it in the uterine variety. TISSOT, however, thinks it possesses but little power. — *β.* Cajuput oil was prescribed with benefit by GOETZ (in *Commerc. Lit. Noric.* 1731, p. 5.), in doses of from two to ten drops on sugar; and by WERLHOF (*Oper. Med.* p. 711.), with cinchona. — *γ.* The oil and other preparations of amber have been found sometimes useful by RIVIERUS (*Prax. Med.* p. 32.), BEATTIE (*De Cognoscend. et Cur. Morb. &c.* Halæ, 1780.), CULLEN (*Mat. Medica*, vol. ii. p. 361.), and others. The oils of hartshorn, cajuput, valerian, and amber, are serviceable chiefly in the simply nervous and asthenic states of the disease; and are useful adjuvants of other medicines, and are often beneficially conjoined with narcotics (§ 97.). Besides these, other oils, both simple and medicated, have been prescribed; but they hardly deserve enumeration.

90. *b.* Phosphorus was, I believe, used for epilepsy first by KRAMER (in *Commerc. Lit. Noric.* 1733, p. 137.); and more recently by FEUERSTEIN, QUARIN, and others. WEIKARD, AUTENRIETH, and HUFELAND justly view it as a doubtful and dangerous remedy. HAARTMANN (*De Norio Phosph. in Med. Usu, &c.* Aboæ, 1773.) gave it in four cases without benefit. — *β.* Cantharides has been tried internally, by MERCURIALIS (*De Morb. Pueror.* l. i. c. 3.), ZACUTUS LUSITANUS (*Prax. Admirab.* l. i. obs. 35.), STOCKAR (*De Usu Canth. Interno.* Goet. 1784, p. 34.), and Dr. J. JOHNSON (*On Derangements of the Liver, &c.* p. 105.), with occasional advantage. Its external use is, however, more common, if not more beneficial, in this complaint.

91. *c.* Guaiacum, either in decoction or substance, has been employed by VESALIUS (HALLER'S *Bibl. Med. Pract.* vol. ii. p. 32.), WILLIS (*De Morb. Convuls.* p. 460.), SENNERT (*Prax. Med.* l. i. c. 31.), MERCURIALIS (*Respons. et Consult.* l. ii. c. 3.), FORESTUS (*Observ. Med.* l. x. obs. 58. 63.), F. HOFFMANN (*Med. Rat. Syst.* t. iv. p. iii. c. i. p. 21.), and others, who considered it possessed of much efficacy in this complaint, especially if connected with a syphilitic taint; but it has been neglected by more modern writers. — *γ.* The flowers of the *Cardamine pratensis* were found beneficial by BERGER and NAGEL (*De Usu Med. Card. Prat. &c.* Franc. 1793, p. 13.); but BAKER (*Trans. of Coll. of Phys.* vol. i. p. 443.), LYSONS (*Pract. Essays, &c.* p. 173.), and GREDING, state it to be inefficacious. The saturated infusion of the flowers and leaves produced a copious and foetid perspiration in the experiments made with it by BERGER (*De Remed. Spec. in Ep. &c.* Franc. 1795, p. 11.) — *δ.* The *Arnica montana* has likewise been noticed by STOERCK, and the *Serpentaria*, by GRUELMANN, when the attack has been occasioned by fright.

92. *d.* The extract of *nux vomica* was praised by SIDREN (in *Acta Med. Silec.* t. i. Upsalæ, 1783, p. 367.), RESE (*De Nuce Vomica.* Jenæ, 1788.

upon the economy, in any one instance; and it is only in respect of spurred rye that we have any kind of data that will admit of the special consideration of the subject. From some circumstances that have come before me, I should infer that unripe grain is productive chiefly of diarrhoea and dysentery; that diseased, impure, or blighted grain, most frequently occasions affections of the nervous and vascular systems, with disorder of the digestive organs, and contamination of the circulating fluids; and that damaged and old grain gives rise principally to fevers of a malignant or adynamic kind, with predominance of some one or more of the preceding affections, according to concurrent causes and circumstances. (See DISEASE — Causation of; GANGRENE, and SPASM.)

ERYSIPELAS. SYN. — Ἐπιφλέγμα, HIPPOCRATES; ἐρυσίπτελας, Gr. (from παρά τὸ ἐρύσσειν ἐπὶ τὸ πέλας, that it extends to adjoining parts; or rather, from ἐρύω, I draw, and πέλας, adjoining; or from ἐρυθρός, red, and πτελός, brown, livid) *Ignis Sacer*, Lat. *Febris Erysipelatosa*, Sydenham, Schroeder, &c. *Febris Erysipelacea*, Hoffmann, Vogel, &c. *Rosa*, Sennert. *Ignis Sancti Antonii*, Auct. Var. *Emphlysis Erysipelas*, Good. *Erysipèle*, Fr. *Die Rose, der Rothlauf*, Germ. *Erisipela*, Risipolu, Ital. *The Rose, St. Anthony's Fire*.

CLASSIF. — 1. Class, Febrile Diseases; 3. Order, Eruptive Diseases (Cullen). 3. Class, Sanguineous Diseases; 3. Order, Eruptive Fevers (Good). 4. Order, Vesicular Eruptions (Willan). III. CLASS, III. ORDER (Author, in Preface).

1. DEFIN. — *Asthenic inflammation of the integuments, affecting them more or less deeply and extensively, with diffused tumefaction, and a disposition to spread, depending upon constitutional disorder.*

2. I. GENERAL DESCRIPTION. — A. *Erysipelas** usually commences with either the local or the constitutional symptoms more prominently marked; but I believe that the local symptoms never manifest themselves before some disorder referrible to the vital sources and centres has been present, although frequently in too slight a degree to alarm the patient or come before the physician. Previous to, or accompanying, a sense of tension, itching, heat, weight, and uneasiness, with diffused redness and swelling of the skin, the patient experiences chills, rigors, disturbance of the functions of the stomach and bowels, and a quickened circulation. On the second and third days, the swelling, which was either slight, or scarcely noticed, increases rapidly, extends superficially, and is warm, shining, of a yellowish red colour, disappearing momentarily during pressure, with a tensive burning pain, exacerbation of fever towards evening, and remissions in the morning. In addition to these, the patient complains of frontal headach, drowsiness,

anxiety at the præcordia, general lassitude, and pain or aching of the limbs; anorexia, nausea, or vomiting; thirst, and heat or dryness of skin. The tongue is generally loaded, and subsequently dry; the bowels are constipated, and the motions offensive; the urine is turbid or saffron-coloured; and the pulse full, soft, frequent, sometimes broad and compressible, and often oppressed or irregular. The disease generally runs its course, in its more acute forms, between the seventh and fifteenth day. It is sometimes extended to the twenty-first, but seldom beyond, unless in cases of relapse or metastasis, or when it assumes certain anomalous forms, or occasions organic changes of subjacent or internal parts, which prolong the fever and increase the danger.

3. B. *Erysipelas* presents phenomena which are peculiar to it, and distinguish it from phlegmonous inflammation, on the one hand, and from the inflammatory action attendant on rheumatism and catarrh, on the other. — α. The character of erysipelatous inflammation are as follows: — α. The pain is peculiar — is tensive, burning, or stinging; is not severe, but is diffused throughout the inflamed surface, and is occasionally remitting. — β. The redness is not intense, as in phlegmon; but is either pale, rose-coloured, or of a pale yellowish hue — arising, seemingly, from a more copious and diffuse deposition of serum, slightly tinged with a little blood. The redness always disappears on pressure, but quickly returns when pressure is removed; it is of a deeper red when the attendant febrile action is of a sthenic kind; and of a more livid hue when the vital powers are much reduced. — γ. Tumefaction is always present, and is sometimes very remarkable, owing to the effusion of serum into the subcutaneous cellular tissue. It is, however, diffused, never acuminate or convex; but sometimes hard or brawny, as in the sthenic or phlogistic variety; and occasionally soft and boggy, as in the cedematous or asthenic variety, or when the adjacent cellular tissue is affected or suppurating.

4. b. *Erysipelas* is seated chiefly in the integuments; but it presents various modifications, according as the more superficial or more internal tissues of the skin are especially diseased. Where the cutis vera is the principal seat, the cellular tissue underneath is also materially affected, being usually infiltrated with serum, tensed, and sometimes inflamed to a very considerable depth in some instances; whilst the more superficial capillaries likewise partake in the disturbance. Where, on the other hand, the rete mucosum and papillary tissue are the chief seat, the disease is commonly accompanied with venousness. When this occurs, or when a discharge from the surface, or free exfoliation of the cuticle, takes place, the severe affection of the subjacent cellular tissue very rarely is observed.

5. c. *Erysipelatous* inflammation has always a tendency to spread to adjoining, and occasionally even to attack remote, parts. As long as the metastasis, or vicarious affection of distant parts, is confined to the integuments, the primitive form and nature of *erysipelas* is retained; but as soon as it has apparently attacked internal organs, which is sometimes the case, owing to their pre-existing disposition and morbid conditions, and to the operation of superadded causes, then the affection of the skin disappears, and the super-

* Some confusion has arisen from the manner in which this disease and *erythema* have been viewed in relation to each other, and in which both have been classed. For, while I admit, with Dr. Good, that the term *erysipelas* has been loosely employed in medical writings, yet I conceive that it will not add to the precision of our knowledge to remove certain of the varieties of *erysipelas* to the genus *erythema*, where their local characters are chiefly considered, and their more important constitutional and vital relations are overlooked.

14. In other parts of the body, the symptoms are generally not so severe. The pain, however, is very great when the disease attacks the *mamma* during lactation, or when it extends to the *organs of generation*. In these situations, it frequently implicates the subcutaneous cellular tissue and adjoining glands, and thus closely approximates in seat and nature to the primary form of spreading inflammation of the cellular tissue. When it occurs in the latter situation, in children between one and six years of age, it often proves fatal, either from this circumstance, or from sloughing ulceration. Where the extremities only are affected, there are generally less pain and constitutional disturbance than in other cases.

15. *B. Modifications of the local affection.*—The changes which take place in the external seat of disease, may be classed under four varieties: the glabrous, vesicular, crustaceous, and deep-seated.—*a.* The *glabrous* local affection consists in a diffused or plane and smooth tumefaction of the skin, of a rose or yellowish redness, sometimes verging to a sub-livid hue.—*b.* The *vesicular* form is attended with bullæ, or blisters, in parts of the inflamed surface, resembling the vesicles raised by cantharides. Sometimes they are numerous, small, and discrete *phlyctenæ*; at other times confluent, and forming very large bullæ, containing a yellowish, sometimes dark, sanguineous, acrid serum, effused between the rete mucosum and cuticle, which it elevates. These vesicles continue to appear during the course of the disease; are accompanied by an unpleasant tension, itching, burning, or pain; and, instead of diminishing, often increase, the inflammation and fever.—*c.* The *crustaceous* form arises from an early rupture of the cuticle, and escape of the lymphatic serum effused beneath it, which exposure to the air forms into crusts, and under which an acrid fluid collects, and irritates, or even ulcerates the skin.—*d.* In the *deep-seated* and *tumefied*, the cellular and other subcutaneous tissues are affected, either by œdema, or by phlegmonous or diffusive inflammation, tending to disorganisation. Whilst the superficial parts of the integuments are the chief seat of the affection, in the preceding varieties, the tissues underneath are principally diseased in this, particularly the cellular and adipose; and they present every shade of morbid action, from simple passive œdema, to inordinate vascular excitement—from the lowest state of asthenia, to the highest degree of vital action—either passing rapidly into suppuration, or into disorganisation, or spreading extensively in the course of the cellular tissue, and involving other adjoining parts, as shown in the article on *Diffusive Inflammation of this Tissue*. It is generally observed in this associated or deep-seated malady, that the skin is but slightly altered, or that the morbid action in it diminishes, as that in the subjacent parts increases, especially if the latter be of a diffusive or septic kind.

16. *C. Modifications connected with the constitutional disturbance.*—The forms which the disease assumes, chiefly result from the states of the nervous system of the assimilating and excreting organs, and of the circulating fluids, and from the temperament and habit of body. These modify the febrile action, as well as the local affection, aided by the existing grades of constitutional power and vital resistance. Erysipelas

consequently presents every intermediate shade between high vascular action with simply diminished vital power, and low vascular action with great depression of the vital energies, as respects both the part chiefly diseased, and the system in general.—*a.* As soon as the morbid action in the skin passes a certain height, it generally extends to the subjacent cellular tissue; and if it occur in young, robust, or plethoric subjects, or if the constitutional powers be not much reduced, or the nervous system not materially exhausted or oppressed; or if the functions of the digestive and excreting organs be not altogether overpowered; then the disease assumes more or less of the *sthenic* or *phlegmonous* character, both as to its local appearance and the attendant fever, and has a marked tendency to pass into suppuration, occasionally with destruction of the subcutaneous cellular and adipose tissues.—*b.* When the disease is attended by signs of accumulated sordes in the *prima via*, with nausea and vomiting, and a morbid state of the secretions, particularly of the biliary secretion—characters which it often presents,—it has received from Continental pathologists, the appellation of *gastric or bilious erysipelas*.—*c.* If it present great depression or disturbance, especially of the cerebro-spinal nervous functions, with a pale, evanescent, and changeable state of the part affected, and imperfect secretion and excretion; and if delirium, coma, subultus, &c. supervene; or if the local affection spreads rapidly, or if it entirely disappears, and is followed by internal disease; it has been called *nervous erysipelas*, or it may be said to be complicated with febrile disturbance of the nervous kind.—*d.* If, owing either to excessive morbid action over vital power, or to a faulty state of the system at the time of attack, or when it supervenes upon remittent or continued fever, or upon any cachectic malady, or in aged or broken-down constitutions, it extends to the subcutaneous structures, and gives rise to œdema, or terminates in softening or disorganisation of these parts, it has received the name of *œdematous, apitic, or gangrenous erysipelas*. This state of the malady is generally connected with defective assimilation and excretion, with an impure state of the circulating fluid, and with deficient vital power.

17. *D. The causes which dispose to, or excite, the disease*, have also great influence in modifying its characters, both local and general. When propagated by infection, it is prone to assume a complicated state, or to be associated with inflammation of the throat and pharynx of a most dangerous character, owing to its disposition to spread to the larynx and trachea; and with diffuse and gangrenous inflammation of the subcutaneous cellular tissue. A similar complication is also observed during certain epidemic constitutions, or when the disease has been occasioned by the contact of animal matters in a state of decomposition, or by other septic agents. In these cases, the tumefaction is often great; and, although vascular excitement may be very remarkable, vital power is much depressed, and speedily overwhelmed, owing chiefly to the morbid state of the circulating fluids, or to the contaminating and septic operation of these causes.

18. III. *DIVISION OF ERYSIPELAS.*—The disease has been divided by authors, according to its various states, into *febrile* and *non-febrile*.

associations, or more complicated states and severe degrees, of erysipelas, are those in which adjoining tissues suffer, or internal organs are disordered, at the same time that the pathognomonic phenomena—the inflammation of the integuments—continue manifest. For, although metastasis to internal viscera, or the inflammation of other parts than of the skin, occurring in cachectic habits, or in those who are subject to this disease, may, with great propriety, be viewed as erysipelatous, as respects the nature of the attendant constitutional affection, yet neither of them can strictly be considered as such, as regards the part affected. The erysipelatous character, however, of the affection, under both circumstances, should not be overlooked; as thereupon ought to depend, in a great measure, the choice of remedies.

26. *A. With Oedema, or Effusion into the Subcutaneous Tissues—E. Oedematodes* of authors.—

a. This state of the disease may be consecutive of the simple varieties, or it may accompany them from the commencement, when they attack the face, or the vicinity of the organs of generation; effusion, in these cases, always taking place in the loose cellular tissue. It often, also, supervenes in the progress of anasarca swellings. Its primary form occurs chiefly in old persons, and broken-down constitutions, consecutively of chronic visceral disease, and in the leucophlegmatic and dropsical diathesis; the affection of the skin and subjacent cellular tissue being nearly coëtaneous. The external surface is of a pale or yellowish red, inclining to brown; generally smooth and glossy; and it is seldom tense. It is but slightly hot or painful; and sometimes neither the one nor the other. The swelling increases gradually, extends slowly, and pits slightly on pressure. Vesications are not common; and the vesicles, which are small, numerous, and flattened, usually appear from the third to the fifth day; they break in a day or two, and are replaced by thin crusts. In the more active states, a sero-puriform, or puriform, fluid infiltrates the cellular tissue, or is discharged from the vesicated surface. The genitals, the face and scalp, the thighs and legs, are chiefly the seat of this variety. Dropsical limbs, especially when the cuticle is cracked or abraded, or after scarifications have been made in them, are often affected by it: and, in these circumstances, there is a marked disposition to gangrene.

27. *b. Oedematous erysipelas terminates*—1st, in resolution, with absorption of the effused fluid; 2d, in suppuration; and, 3d, in softening, sloughing, and gangrenous destruction of the part.—*Suppuration* occasionally takes place; but is generally of an irregular or diffusive kind, extending in the course of the vessels, and between tendons and muscles; is preceded by a boggy state of the swelling; and is often attended by disorganisation of portions of the cellular membrane.—*Gangrene* is indicated by severe pain; and a red and glossy state of the surface, passing into a livid or leaden hue.

28. *B. With Inflammation of the Subcutaneous Structures—Er. Phlegmonosum vel Phlegmonodes*, Auct. var.; *Diffuse Phlegmon*, DUPUYTREN; *Er. Spurium, Pseudo-Erysipelas*, RUST.—This is a most important and often dangerous disease; especially when epidemic, or propa-

gated by infection. It is very varied in form and seat; and presents every grade of activity, from the passive or oedematous state, just described, to the most acute grades that rapidly pass into gangrene (§ 31.).—When it occurs *sporadically*, its local character is that of “diffused phlegmon;” the attendant fever being of an inflammatory kind, and preceded by rigors. In this case, vascular action is more acute; the swelling is greater and more circumscribed; the pain and burning more remarkable, and more pulsating; the redness deeper; the temperature higher; and the disposition to pass into suppuration greater, but to change its situation less, than in other circumstances. Where the symptoms are very acute, the subjacent cellular and adipose tissue frequently are profoundly affected, the fasciæ, the intermuscular substance, and even the fibrous structures, becoming inflamed. In such cases, disorganisation of the cellular and adipose tissues often rapidly supervenes; the part passes from a *brawny* and tumefied, to a flaccid and *boggy*, state; and the attendant fever changes to a low or adynamic form. When occurring *epidemically*, or from infection, the local and constitutional symptoms are more severe; vital power and resistance are diminished; and the disease is often complicated with a very dangerous affection of the throat and adjoining parts. This variety may be divided, as suggested by M. RAYER, into *three grades*.

29. *a.* In the *first*, after rigors, and in connection with the constitutional symptoms described above (§ 2.), tingling, heat, and redness, followed by hard tumefaction of the part, begin to appear. A stinging pain, tension, and burning heat are complained of in the seat of swelling; which is diffused, hard, and deep-seated. After pressing the surface with the finger, the redness returns more slowly than in the superficial and simple disease. The lymphatic glands often become inflamed or enlarged; and febrile action is fully developed. If, about the fifth or sixth day, the skin be less red and tense, or covered by furfuraceous scales, and the swelling subsides, *resolution* has commenced. *Oedema* of the cellular tissue, however, sometimes remains for two or three days. But if the pain, about this period, become pulsating, *suppuration* in one or more parts is inevitable. The abscesses thus formed generally give issue to well-digested pus, and heal in a few days.

30. *b.* In the *second grade* of this variety, inflammation is more extensive; and the redness, heat, pain, and fever are greater. If the disease be not arrested, abscesses form, very insidiously, from the sixth to the ninth day, or even earlier; or a sero-puriform fluid infiltrates the cellular tissue, extending between the muscles and under the integuments; and, upon free openings being made, disorganised portions of this tissue are discharged with the puriform or ichorous matter. Fistulous cavities frequently are formed, giving issue to a foetid and ichorous pus.—Sometimes the skin is thinned or detached, and falls within the margin of the ulceration (RAYER). In these cases, the stomach and bowels frequently become irritable; and the patient dies, either from the exhaustion occasioned by diarrhoea, or by the extensive suppuration and disorganisation of the cellular tissue; or from the absorption of the morbid

branes of the brain, analogous to the vascular excitement of the skin, often occasioning an increased exhalation of serum: hence the delirium, passing frequently into coma. In the latter circumstance, the cerebral disturbance is the result rather of depressed vital power, manifested especially in the cerebral functions, and of the morbid changes in the blood, than of inflammatory action. The pulse is frequent, but variable as to fulness and power. The tongue is at first loaded, red at the point and edges, and afterwards dry in the middle, and of a brown or dusky hue. The excretions are suppressed or impeded; and, in the worst cases, particularly towards the close, are passed unconsciously. Tremors, subsultus of the tendons, floccitation, &c. are then also observed. A fatal termination occurs generally from the seventh to the fourteenth day, or later. A bilious diarrhoea, or copious fæculent and offensive stools; a free discharge of urine depositing a copious sediment; and a general, warm, and copious perspiration; are favourable occurrences.

36. *E. With Gastric and Bilious Disorder.*—The bilious nature of erysipelas was strenuously insisted on by STOLL, DESSAULT, and others. Antecedent disorder of the digestive and assimilating organs is more or less evident in all the varieties, but especially in this, which is of common occurrence during summer and autumn, when the digestive mucous surface and biliary apparatus are most liable to be diseased. It is generally attended by manifest signs of accumulated sordes and morbid secretions in the *prima via*, and of an increased secretion of acrid bile, especially when the disease is epidemic at the seasons just mentioned.

37. *F. Erysipelas* may, moreover, be complicated with inflammatory action of the mucous surfaces, analogous to that of the skin, giving rise to a form of *bronchitis* or *gastritis*. Where it is connected with inflammatory sore throat, it sometimes extends along either the trachea, or the oesophagus, or even both, until the lungs, or the stomach and bowels, are affected; and, occasionally, along the Eustachian tube, to the ear; it thus becoming complicated with one, or even more, of these affections. This connection, first distinctly pointed out by J. P. FRANK, has more recently been insisted upon by BROUSSAIS, ELLIOTSON, and others. FRANK alludes to instances in which erysipelatous inflammation extended from the pudenda, along the vagina, to the uterus, and even to the bladder. Erysipelas may be further complicated with inflammation of the lymphatics, particularly when caused by breach of surface; or with *phlebitis*, when consequent upon injury, or when it has proceeded to suppuration.

38. *G. Erysipelas* may occur in the course of continued and remittent fevers; and it may appear during convalescence from any of the exanthemata.—In the first of these associations, it generally presents an adynamic character, with nervous or with malignant symptoms; frequently attacks the face, throat, and scalp; or the parts pressed upon in bed, or irritated by the evacuations; and is especially disposed to gangrene. When it supervenes upon remittents, it often assumes a bilious or gastric form; and in these, as well as in exanthematous fevers, it may prove a salutary crisis, if the pulse do not rise in fre-

quency; and if the cerebral functions remain undisturbed. In crowded sick wards, and in lying-in hospitals, it often occurs in the progress of other diseases, with which it consequently becomes complicated. But it is a most dangerous circumstance; as it is, in those cases, caused by an infected or impure air, which, favoured by the depressed state of vital power, or by imperfect excretion, has contaminated the circulating and secreted fluids.

39. IV. LESIONS IN FATAL CASES.—When the cellular tissue has not been severely affected, the injection of the integuments subsides considerably after death; and hence the redness of the external surface, as well as that of the throat, has often nearly or altogether disappeared. In addition to infiltration of the subcutaneous tissues with serum, or a sero-puriform matter, and occasional disorganisation or gangrene of these and of the integuments, various internal lesions are commonly observed. The blood in the large vessels and cavities of the heart is frequently semifluid; and the veins proceeding from the part chiefly affected, are often inflamed, or contain pus; as first observed by M. RIBES, and confirmed by M. M. DANCE, ARNOTT, and by my own observations, especially when the disease has been complicated with diffuse suppuration of adjoining cellular parts. In cases that have been attended by cephalic affection, the membranes of the brain are sometimes injected, or inflamed, and the arachnoid opaque, with serum effused between them, and in the ventricles; but, as M. PONSARD has shown, these lesions are often not observed in this complication. Where the throat has been affected, the *fauces*, *pharynx*, and *oesophagus* are of a dark or dusky red, or of a livid or brown tint; much softened, sometimes with small patches of dark lymph on their surfaces; and the subjacent tissues infiltrated with a bloody serum, or with a sero-puriform matter. These appearances occasionally extend to the *larynx* and *trachea*, the submucous tissues being oedematous, or infiltrated with similar fluids.—In cases that have been associated with bronchial or pulmonary disorder, the lungs are congested with a dark semifluid blood; the *bronchi* are of a dark red or brown colour, are injected, and often contain a frothy and bloody fluid; portions of the lungs being oedematous, and others partially hepatized.—The mucous surface of the *stomach* and *intestines* is generally injected, of a deep or dark colour, often softened, and, where the bowels had been much affected, abraded, or inflamed, especially in the *cæcum* and *rectum*. The *liver* and *spleen* are seldom found in a healthy state, particularly in persons advanced in age; but they present no lesions peculiar to this complaint, excepting that those usually resulting from intemperance are most frequently observed.

39. V. DIAGNOSIS.—The antecedent constitutional disturbance, with excited vascular action and drowsiness;—the dull or yellowish red, or rose-colour, of the integuments, terminating in an irregular, but well defined margin, and disappearing, momentarily, on pressure;—the pricking, stinging, and burning heat and pain of the part, sometimes with irregular vesications;—the slight plane, and diffused tumefaction, or the greater swelling and diffused affection of the cellular tissue in connection with the inflammation of the

matter is yellow, whitish yellow, yellowish green, or reddish yellow; presents all the characters of pure pus, excepting in the intervals when the more scanty sputa are generally mixed with mucus; and ultimately becomes more offensive, and assumes deeper shades of colour. I lately attended a case where abscess formed in the substance of the right lung presented these well-defined characters; yet the patient never coughed during its formation — although it was so large as to bulge out the right side of the thorax — nor until the time of its bursting into the bronchi.

11. *D.* The appearance of fine, white streaks; or the presence of *whitish*, or *whitish yellow*, *small masses*, like boiled rice, in mucous or mucopuriform sputa, generally indicates the softening of tubercles: but the earlier and more advanced stages of phthisis are attended by the very varying state of the expectoration described in the article on that malady. *Sabulous*, *calcareous*, or *earthy matters* are sometimes expectorated in certain states of pulmonary or phthisical disease; but these matters do not indicate the most dangerous forms; for I have known several cases where recovery took place after their discharge. The presence of *hydatids* in the expectoration is very rare. — Substances that are swallowed, are sometimes coughed up from the trachea, through an ulcerated communication formed between it and the œsophagus. ZEVIANI records a case of this kind; and one was, a few years since, attended by Mr. BYAM and myself. The various modifications of the expectoration, during the progress of pulmonary diseases, are minutely described in the articles BRONCHI, HEMORRHAGE, LUNGS, and TUBERCULAR CONSUMPTION; and the indications derived from this source are there duly pointed out.

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EYE, DISEASES OF THE. — SYN. ὀφθαλμοίς. Oculus. Das Auge, Germ. Œil, Fr. Occhio, Ital.

CLASSIF. SPECIAL PATHOLOGY — MORBID STRUCTURES.

1. The progress of knowledge, in respect of diseases of the eye, has been very remarkable since the end of the last century; owing chiefly to the researches and writings of BEER, SCHMIDT, HIMLY, SCARPA, BENEDICT, DEMOURS, EDMONDSTON, VEICH, WARDROP, WELLER, TRAVERS, GUTHRIE, MACKENZIE, and LAWRENCE. In the account that will be here given of these diseases, those only which are inflammatory, and conse-

quent upon inflammation, will be considered. Functional disorders are treated of in separate articles. (See AMAUROSIS, SIGHT, &c.). The order in which these maladies will be discussed, will differ but little from that adopted in the truly valuable works of Mr. LAWRENCE and Mr. MACKENZIE; to which I have much pleasure in stating my obligations. — The latter of these writers, and J. FRANK, treat first of the diseases of the eyeballs and lachrymal apparatus, and next of the eye itself. Mr. LAWRENCE enters at once upon the consideration of the inflammatory diseases of the tissues of the eye-ball, and concludes his classical production with those of the appendages. Either arrangement is unexceptionable; but I shall follow the latter, merely as being more congruous with the medical view of the subject, to which I shall chiefly confine myself. The surgical treatment of such of those diseases as require it, must be studied in the works now referred to, or in Mr. COOPER's *Surgical Dictionary*.¹ I shall, therefore, first treat of inflammations affecting the external coats of the eye, and afterwards of those attacking the internal tissues of the organ.

I. INFLAMMATIONS OF THE EYE. — SYN. Ophthalmia; Lippitudo, Celsus; Augenentzündung, Germ.; Ophthalmis, Fr.; Ottalmia, Ital.

CLASSIF. — 1. Class, 2. Order (Cullen).

3. Class, 2. Order (Good). III. CLASS, I. ORDER (Author).

2. DEFIN. — Pain in one or both eyes, with vascular injection of one or more of their constituent tissues, and constitutional disorder.

3. Inflammations of the eye are of various grades and kinds: they commence in any one of the different tissues forming the organ; and they are thus limited more or less, and for a longer or shorter period of their course, according to the temperament, habit of body, and diathesis of the patient; to the state of predisposition, and the nature of the exciting causes; and to the treatment adopted. Before considering separately the different varieties of ophthalmia, I shall first take a general view of their causes; and next of the numerous forms they present, owing to the varied concurrence of predisposing and exciting causes.

4. i. CAUSES. — A. The predisposing causes of inflammation of the eye are nearly the same as those of inflammatory diseases of other organs. — (a) *Temperament*, *idiosyncrasy*, and consequently *hereditary disposition*, evidently favour its occurrence. The colour of the eye has apparently but little influence, for Dr. SMITH found the relative proportion of cases in light eyes nearly the same as in dark eyes. — (b) *Morbid diathesis*, especially the *scrofulous*, has the most remarkable effect, and next the *gouty* and *rheumatic*. These not only dispose to, but also modify, the disease, and its consequences, and require for it appropriate modes of treatment. — (c) It is difficult to determine how far age and sex have any influence; but advanced age certainly favours the supervention of chronic inflammation of the organ. — (d) *Climate* has a much more manifest effect. The excessive cold, and reflected light, in hyperborean regions; and the great warmth, dryness, and reflected heat of some countries, especially Egypt, Arabia, &c., heightened by the quantity of fine dust floating in the atmosphere; not only predispose to, but excite, ophthalmia. — (e) Great exertion of the eyes occasions disease of

and the *rapidity* of the progress, of ophthalmia, vary from the slightest increase of vascular injection and action, and the most prolonged continuance, up to the most violent and rapid states in which inflammatory action is ever manifested. Hence the conventional terms of *acute*, *chronic*, and *sub-acute* or intermediate, are to be viewed with due latitude as to their import. But ophthalmia, like other inflammations, may be modified in *kind or form*, as well as in *grade and duration*, owing to peculiarity of constitution, morbid diathesis, the manifestations of vital power, and the state of the circulating fluids. Thus, ophthalmia in the scrofulous, gouty, or rheumatic diathesis, is different from that affecting sound constitutions; and that occurring in the course of, or subsequent to, the exanthemata, or during typhus fever, or after the passage of purulent matter into the circulation, is individually different from either of the foregoing, although the grade of action and of vascular injection may be apparently the same in all. I cannot, therefore, agree with Mr. LAWRENCE, when he infers that no such distinctions as *sthenic* and *asthenic* actually exist (*Treatise*, &c. p. 66.). This conclusion is the result of considering inflammation merely as increased vascular action, and without reference to the state of local and general vital power. But the phenomena, the progress, and the results of inflammation, in the various forms and circumstances in which it occurs, as well as the effects of treatment, show, that excited vascular action does not imply increased power; and that the former often exists, not only without the latter, but even with a diminution of it, as fully shown in the articles DISEASE, ERYSIPELAS, FEVER, and INFLAMMATION.

8. Ophthalmia differs in degree, at different periods of its course. Thus, it may be slight and prolonged, and suddenly become most violent, acute, and rapid; or, from the latter, it may lapse into an indolent, slow, or chronic form; owing to various contingent causes, to constitution, and to the treatment adopted. It is also remarkably modified by the tissue in which it is seated; by the nature of the predisposing and exciting causes; but its supervention upon, or complication with, other morbid states, or specific forms of disease; and by the age, habit of body, and regimen of the patient. Out of these circumstances arise the numerous varieties distinctly established by modern writers, and recognised by every observing practitioner, and the arrangements of them adopted in recent systematic works. The importance of divisions of this subject is shown by the different consequences or terminations usually observed to belong to each of the varieties, and by the modified treatment they individually require. Without carrying the subdivision as far as J. FRANK, or too far for practical purposes, I shall first consider inflammation of the *external tissues* of the eyeball, next those seated in the *internal tissues*, and lastly the much more rare occurrence of inflammation of the *whole eye*. In treating of inflammation of each of the tissues, its *common form* will be first described, and afterwards those *specific* or modified kinds, it occasionally assumes from peculiarity of cause or of diathesis.

II. INFLAMMATION OF THE EXTERNAL TISSUES OF THE EYE.—I. OF THE CONJUNCTIVA.—SYN.

Conjunctivitis, MACKENZIE; *Ophthalmia*, of numerous writers.

9. CHARACT.—*Redness*, from increased vascularity of the external coat of the eye, with pain, tumefaction, and febrile disturbance of the system; the enlarged vessels shifting their places with the motions of the eyeball or eyelids.

10. The muco-cutaneous membrane that covers the insides of the eyelids, and anterior third of the eyeball, may be inflamed in particular parts, or throughout its extent, in every grade of severity, and for various periods of duration. When this membrane is inflamed, the vessels are comparatively large, tortuous, and of a scarlet colour. They anastomose very freely, or form a network over the white of the eye, and are drawn aside by dragging the eyelids, or moved by rolling the eyeball; whereas, when the sclerotica is inflamed, the vessels are small, straight, of a pink hue, and unsuspceptible of motion, either by dragging the eyelids or rolling the globe. When, however, the inflammation is so severe that chemosis exists, or the conjunctiva becomes tumid, and the discharge copious and muco-purulent, this distinction cannot be made, nor, indeed, does it altogether exist, as the inflammatory action from contiguity extends more or less to the sclerotica, and even to the iris and the cornea.

A. MILD INFLAMMATION OF THE CONJUNCTIVA.

—SYN. *Catarrhal Ophthalmia*, LAWRENCE; *Conjunctivitis puro-mucosa atmospherica*, MACKENZIE; *Conjunctivitis catarrhalis*.

11. a. I have adopted the appellation employed by Dr. JACOB as the most appropriate; for, although the disease is generally caused by exposure to cold, yet it sometimes also arises otherwise. It is most common in spring and autumn, is sometimes epidemic; affects young persons oftener than adults; and frequently attacks most of the members of a family, or, when it appears in a school, a large number of children. Exposure to currents of cold air, or to the night air, north-east or easterly winds, and other atmospheric influences; damp feet; intoxication; for, smoky apartments, irritating vapours; and disorders of the digestive organs; most commonly occasion it. A person who has once experienced an attack, is very liable to a return of it; and I believe, with Mr. MACKENZIE, that, in the most severe cases, when the discharge is puriform, it may be propagated by contagion; the disease then passing into the purulent and severe form.

12. b. Symptoms.—This form of ophthalmia seldom extends deeper than the conjunctiva. It may be confined chiefly to the lids (*Blepharoconjunctivitis catarrhalis*; and may affect also the globe (*Ophthalmconjunctivitis catarrhalis*). It commonly commences in the eyelids, or circumference of the globe, and extends gradually to the cornea, with a sense of stiffness, smarting, dryness, and as if dust had got into the eye. The intolerance of light and pain are slight; and the secretion at first is diminished, but it is soon succeeded by watering and increased redness. When more fully developed, the redness is superficial, somewhat irregular, of a bright scarlet; and the enlarged vessels are superficial, and are readily pushed aside by pulling the eyelids. In the most severe and acute cases, the membranes become generally and uniformly red; sometimes with spots of ecchymosis, or with minute vesicles or

or ill-nourished infants, the astringents about to be noticed may be at once employed. In every instance, purgatives ought to be prescribed. One grain of hydrargyrum cum creta, or of calomel, may be given, with three or four of magnesia or of rhubarb, at bedtime, and a dose of castor oil in the morning. A small blister may be applied on the posterior and middle part of the scalp, as advised by Dr. MONTEATH; but it should be removed in five or six hours, and the part carefully attended to. The eye should be bathed frequently with tepid milk and water, and a little fresh butter, or a mild form of the red precipitate ointment, applied between the edges of the lids at night, to prevent their agglutination, and favour the escape of the discharge.

28. Astringent collyria are more efficacious, and safer in this affection, than in any other, especially when resorted to at its commencement. But in severe cases, when the inflammation has proceeded so far as to endanger the cornea, it will be much safer to premise depletion, than to enter at once upon the use of astringents. Mr. WARE recommends a preparation formed by pouring eight ounces of boiling water on eight grains each of sulphate of copper and Armenian bole, and two of camphor. SCHMIDT prescribes a lotion of two grains of sulphate of zinc, three drops of liquor plumbi super-acetatis, twelve drops of spiritus vini camphoratus, and an ounce of distilled water. Mr. GUTHRIE directs the nitrate of silver ointment (§ 49.) to be applied with a brush over the inside of the lids. Mr. MACKENZIE employs a collyrium of one grain of bichloride of mercury and eight ounces of water, three or four times in the day; and, having washed off the discharge by this lotion, he applies, once, or at most twice, a day, to the conjunctiva, a solution of four grains of lunar caustic, or of six grains of sulphate of copper, in an ounce of water, by means of a camel-hair pencil; preventing the agglutination of the lids by smearing their edges at night with the mild red precipitate ointment (consisting of from twelve to twenty grains of the precipitate to the ounce). Dr. MONTEATH uses a nearly similar collyrium to that prescribed by this writer. Mr. LAWRENCE advises a solution of from two to ten grains of alum in an ounce of water, to be carefully injected between the lids three or four times in the twenty-four hours, so as to wash out the purulent secretion; and afterwards a soft rag, moistened in the solution, to be laid over the eye for a short time; the bowels being regulated by a mild aperient. If there be occasion to change the astringent, he prefers the lunar caustic solution, gradually increasing its strength from two grains to the ounce, to four or six, to be dropped between the lids twice or thrice a day.

29. When the cornea has ulcerated or sloughed, the infant is generally pale, weak, irritable, and restless; and tonics are required. The sulphate of quinine in the form of syrup, and the resinous extract of bark blended in milk, and given every three, four, or six hours, are the best preparations. The solution of the nitrate of silver, or of alum, may be applied to the eye. Opacity of the cornea is generally permanent; but instances of recovery have occurred. M. BILLARD mentions a case in which the recovery was spontaneous.

30. *ζ. Purulent Ophthalmia in Children.*—The

treatment just recommended is most appropriate to newly-born infants, or to children of one, two, or three years old. In these latter, and in those somewhat older, the local depletion should be more active, according to their habit of body and strength; and blisters behind the ears are of much service. Blisters, unless employed with caution, and only so far as to produce slight redness, and followed by the application of warm poultices to the part, often are productive of much trouble in young infants; in older subjects, they are more beneficial. In the latter class of patients, vascular depletion, according to the circumstances of the case and of the patient, purgatives, blisters, and astringent applications, constitute the chief means of cure. Purulent ophthalmia introduced in large or crowded schools or foundling hospitals, may spread extensively and prevail long. Mr. MACGREGOR has described its prevalence for some years among the children of the Military Asylum at Chelsea. It was most severe in those having red hair, or of the scrofulous diathesis. It commenced in the eyelids with itching, sticking together of the lids on waking in the morning, followed, in twenty-four or thirty-six hours, by a viscid mucous secretion, extension of the inflammation of the conjunctiva oculi, redness of the skin around the eye, and a purulent discharge. General bleeding, leeching, purgatives, blisters behind the ears and on the nape of the neck, cold lotions, low diet, and, subsequently, astringent collyria, and the unguentum hydrarg. nitratis, at first mixed with twice its quantity of lard, but afterwards of its full strength, applied to the lids by means of a camel-hair pencil, were the remedies found most beneficial.

b. *PURULENT OPHTHALMIA IN ADULTS.*—*Syn.* *Oph. purulenta* or *puriformis*, *Suppurative Oph.*, *Egyptian Oph.*, *Ophthalmia* and *Blepharoblennorrhœa*, Auct. var.; *Oph. contagiosa*; *Oph. catarrhalis bellica*; *Blepharitis glandularis contagiosa*, BEER; *Adenitis palpebrarum contagiosa*; *Epidemic contagious Oph.* ROBES; *Conjunctivitis puro-mucosa contagiosa vel Egyptiaca*, MACKENZIE; *Purulent Oph. in the Adult*, LAWRENCE.

31. This affection is essentially the same as that just described as to both nature and seat; it commences and extends in a similar manner, and produces the same ill effects, especially as respects the cornea and iris. Its severity, its serious consequences, its contagious properties, and its extensive prevalence, at the commencement of this century, impart to it the highest interest. ASSALINI states, that two thirds of the French army in Egypt were affected with the complaint. Dr. VETCH treated 636 cases, including relapses, belonging to the second battalion of the 52d regiment, from August, 1805, to August, 1806; fifty having lost both eyes, and forty, one eye: and the ophthalmia depôt, under his able care, contained in the summer of 1806, upwards of 900 cases. Mr. MACGREGOR mentions that the returns of Chelsea and Kilmainham hospitals furnished 2317 cases; soldiers who had lost the sight of one eye not being included in the number: and that, from April to December, 1804, nearly 400 cases of this disease occurred in the Royal Military Asylum; and from that time to the end of 1820, upwards

SANI, GRAEFKE, and others, produced the disease repeatedly in dogs and cats by the application of matter to their eyes; and M. GUILLIÉ introduced under the eyelids of four blind children the purulent discharge, and the disease was communicated in each instance.

35. But independently of these incontrovertible facts, others equally satisfactory may be adduced. It is not denied that the disease extended from the detachments of the French and English armies which returned from Egypt, to the troops in Italy, Sicily, Malta, Gibraltar, France, and England, which had direct communication with them; the progress of the complaint having been clearly traced from the infected detachments to the fresh troops. The excellent accounts furnished by Dr. EDMONDSTON, VETCH, MACGREGOR, RUST, WALTHER, MUELLER, GRAEFKE, and others, completely demonstrate its spread by contagion, and show that it extends rapidly among soldiers crowded in barracks, using the same utensils and linen, whilst the officers, who live separately, are seldom attacked. RUST states that, in Mentz, which was garrisoned by Prussians and Austrians, it spread extensively among the former; while the latter, who inhabited separate barracks, in a different quarter of the town, entirely escaped. Dr. EDMONDSTON adduces a most conclusive fact. In 1782, the Albemarle ship of war took on board, in the West Indies, three sailors, with inflamed eyes, from a slave-ship, in which the disease prevailed. On the fourth day after their reception, the disorder appeared in the Albemarle; and, by the seventh morning, twenty-two men were unfit for duty. Those affected were now separated from the healthy, and the progress of the malady was arrested, and, in the course of a few weeks, entirely ceased. Similar facts to the above may be adduced; and most of those about to be noticed in illustration of points connected with this subject, fully prove contagion. Numerous instances have occurred in civil life, of the disease extending from one, to all the members of a family; and, in the public service, where the circumstances favouring its spread are more numerous and influential than elsewhere, it has been arrested by separating the diseased from the healthy, and confining each person to his own utensils, clothes, and sponges. Mr. MACGREGOR states that, when the complaint was spreading rapidly in the spring of 1810, among the children of the Military Asylum, those affected were removed into a detached building, so as to cut off the communication between the healthy and diseased; and that it afterwards declined. That it did not arise from the state of the air, or any other general cause, is shown by the circumstance of its prevalence among the boys for nearly a month, before the girls were attacked; and by the fact, that all the adults who did not mix with the sick escaped, while those who were connected with them all suffered, the assistant surgeon excepted. Similar proofs are adduced by RUST, WALTHER, and OMODEI, in the works referred to in the *Bibliography*. Mr. MACGREGOR has given a most convincing account of its extension, by contagion, from two boys, brothers, in the Military Asylum, in his *Memoir* referred to hereafter.

36. 3d. *The origin of the contagious property*
— *the manner of, and the circumstances favour-*

ing, its propagation, are matters of great practical importance, as respects both prophylactic and curative measures.—(a) As to the origin of the contagion, Dr. VETCH has made an important observation, and one which appears to approach very nearly to the truth. He remarks that, from whatever cause inflammation of the conjunctiva may originate, when the action is of such a nature or degree as to produce a purulent discharge (*Ophthalmoblenorrhœa*), the discharge so produced operates as an animal virus when applied to the conjunctiva of a healthy eye. To this I would merely add, of a predisposed or susceptible person.—The opinion of Mr. MACKENZIE agrees with that now stated. He observes, that it scarcely admits of a doubt, that the discharge in *catarrhal ophthalmia*, especially when distinctly puriform, if conveyed by a towel, or by the fingers, to the eyes of other persons, will excite a conjunctivitis still more severe, more distinctly puriform, and more dangerous in its effects, than was the original affection. He has arrived at this conclusion, from having observed many instances, in which the disease had arisen in one of a family from atmospheric exposure, and several others had become affected, it having been, in the first attacked, comparatively moderate, but, in the rest, much more violent and puriform. Similar facts have been remarked by myself. That the disease may arise spontaneously, and afterwards extend by contagion, is evinced by the following occurrence adduced by M. GUILLIÉ. A French slave-ship left the coast of Africa in 1819, with 160 slaves crowded in the hold. No case of ophthalmia existed among them, nor among the crew, when they put to sea. But fifteen days afterwards it broke out in the negroes, and spread rapidly among them, and subsequently among the crew, twenty-two in number, one only of whom escaped. On their passage across the Atlantic to the West Indies, they met another slave-ship, the crew of which was similarly circumstanced to themselves. Nearly one half of the crew and slaves lost their sight in one or both eyes.

37. (b) As to the manner of the propagation of the disease, some difference of opinion is entertained. Dr. VETCH believes that it is not communicable by a contagious miasm conveyed through the medium of the atmosphere; and thinks that direct application of matter is necessary to infection. Mr. MACGREGOR expresses a similar opinion, although many of his facts favour the conclusion at which I shall arrive in the sequel. MUELLER, on the other hand, considers that the contagion is generally conveyed by the air, although it necessarily also admits of being propagated by direct contact, and, in proof of this position, adduces the fact of the medical attendants and nurses, notwithstanding their care to avoid the contact of the discharge, having been frequently affected. WALTHER entertains the same opinion, and appeals to similar facts in support of it. Dr. EDMONDSTON, the first writer who demonstrated the contagious nature of the complaint, and attempted to assign the range and laws of this property in respect of it, considers that it is contagious, not only by the contact of the discharge, but also by fomites, and through the medium of the atmosphere within a limited range, when a number of cases are brought

of several days occur before the second becomes inflamed. Such are the features of this disease as it prevailed in the British army, and as it sometimes occurs in civil life under certain circumstances.

42. (b) *The milder or chronic states.*—These were most common on the Continent, both in the army and in civil society. Mr. MACCORMACK, Dr. VETCH, Professor WALTHER, and Dr. MUELLER, particularly the last, have pointed out, not only the origin of the complaint, in the conjunctiva of the lids, but also its long persistence in this part, in some cases, and its entire limitation to it, in others. In all the grades, the inflammation both begins and terminates in it.—In the *slightest grades*, the patient complains of pressure or uneasiness, with a sense of dust or sand, in the eye; but without redness of the globe, or of the external surface of the palpebræ. The conjunctiva tarsi is villous and dark red; but towards the globe it is smooth, and its vessels distended. The eyeball has an irritated appearance: there is an increased flow of tears, and a mucous secretion, but little or no pain. The disease may continue long in this mild form, or may yield to treatment in two or three weeks; or it may pass into a higher or severer grade.—The *second or intermediate degree* may be an aggravation of the first or slightest grade, or may commence with all its characteristic features. The conjunctiva of the lids has a granular appearance, which becomes more conspicuous when the inflammatory tension is abated, and is swollen, dark red, and covered by a puriform secretion. The lids are tumefied; the pain is considerable, and as if caused by a foreign body. This form may continue for weeks or even months, and pass into the severe or acute state already described (§ 41.), owing to atmospheric changes or other causes; unfavourable consequences to the organ supervening sometimes in twenty-four or thirty-six hours.

43. (c) *The alterations* which the conjunctiva undergoes are of much importance. In the mildest grade, the membrane appears as if covered with dust, or velvety; in the severest degrees, it seems strewed with rough bodies, or with granulations, resembling those of a healing wound. These bodies exist in great number, arise by a broad basis, and have a round prominence at first, which becomes flattened or angular by pressure against the globe. The largest of them are in the middle of the lid, the smallest at the edge and near the angles. They are sometimes crowded very close, and are most remarkable in the upper lid. Their colour varies from the darkest blood red to the palest brick hue. MUELLER considers this change of structure not as a mere effect of inflammation, but as proper to the disease, and as connected with the production of the contagious secretion disseminating the complaint.

44. γ. *Consequences.*—1. *Suppuration of the Cornea*, and destruction by ulceration, sometimes supervene; the progress of the disease usually leading to the escape of the humours, and collapse of the globe.—2. *Ulceration* frequently takes place, to the extent, and in the manner, described above (§ 24, 25.).—3. *Sloughing of the cornea* rarely or never occurs in this variety. Mr. LAWRENCE has not met with it, and other writers do not mention it.—4. *Bursting of the cornea* is less rare, particularly during suppuration or

ulceration. Dr. VETCH met with cases, in which the rupture occurred without previous change; the aqueous humour having escaped by a clear division or rent in the cornea, which afterwards became opaque, and projected around the opening; but this occurrence is very seldom observed.—5. *Interstitial deposition* in the conjunctival covering, or the corneal laminae, occasioning opacity of every degree; the slightest grades often disappearing after recovery.—6. *Loosening or thickening of the mucous membrane* covering the cornea, with enlargement of its vessels, and diminution of its transparency.—7. *Opacity* from cicatrization of ulcers.—8. *Prolapse of the iris*, partial or total (*Staphyloma racemosum*).—9. *Adhesion of the iris to the cornea* (*Synchia anterior*), either with or without prolapse.—10. *Staphyloma*, general or partial, or other changes, from extension of the inflammation to internal parts of the organ.—11. *Weakness or irritability of the eyes*, which usually disappears sooner or later.—12. *Impaired vision* (*Amblyopia*), arising from numerous causes; as turgidity of vessels in the orbit, and surrounding the optic nerves; slight alterations of the choroid, retina, or lens; and lesions within the cranium.—13. *Thickening, induration, and granulation of the conjunctiva of the lids.*—14. *Temporary and permanent ectropium and entropium.*—And, 15. *A great tendency to relapse*, upon exposure to very slight causes. This last especially occurs, when the palpebral conjunctiva has not been restored to its natural state,—a result not readily attained after severe or prolonged attacks, and which WALTON doubts ever to be entirely accomplished. Hence a person may be considered as cured, but experience a return of the complaint, from exposure to cold or intoxication, and may spread the disease in the family in which he resides.

45. δ. *Diagnosis.*—Purulent ophthalmia in the adult may be mistaken for the *catarrhal* and *gonorrhœal* varieties. The peculiar change in the palpebral conjunctiva, the great chemosis and swelling of the lids, the extreme redness and vascular congestion, the profuse purulent discharge, the long continuance of the complaint, its tendency to affect the cornea, and the disposition to relapses, sufficiently distinguish it from *catarrhal* or mild ophthalmia. Nevertheless, the mildest cases of the former, and the severest of the latter, hardly differ in any respect. The specific cause and nature of *gonorrhœal* ophthalmia, and its uniformly acute and violent form, distinguish it from the purulent variety. There are, besides, other differences, which will be noticed hereafter (§ 59.).

46. ε. *Treatment.*—(a) *Of the most acute, or highest grade of the disease.*—The intention should be to arrest the violence of the inflammation, and prevent the extension of it to the cornea. If the patient be seen sufficiently early, or before the conjunctiva oculi be much inflamed, or chemosis have appeared, the treatment advised in *catarrhal* ophthalmia will generally succeed. But, if the disease be thus far advanced, and has assumed a severe form, the most active antiphlogistic means ought to be resorted to. VETCH, MUELLER, RUST, WALTHER, LAWRENCE, and other experienced writers, recommend *bleeding* carried at once sufficiently far to produce a decided effect upon the circulation, without regard

to be removed, and the strong ointment re-applied, so that the new action that should be set up may not cease; the other remedies are likewise to be continued. In addition to these, he gives calomel and opium, so as to affect the mouth; and the other more common remedies.

50. As different writers prescribe different astringents, and of various grades of strength, it were desirable that some more precise knowledge were attained as to which is the safest and most efficient. Dr. JACOB, after passing acetate of lead, alum, sulphate of copper, sulphate of zinc, bichloride of mercury, and lunar caustic in review, decides in favour of the undiluted liquor plumbi diacetatis, and strong solutions of alum, or of the nitrate of silver; which, however, he recommends after the painfully acute stage has passed, and in the chronic or atonic state of the complaint. Mr. MACKENZIE directs a tepid solution of one grain of corrosive sublimate in eight ounces of water, to be injected under the lids, for the purpose of cleaning the eyes; and, as an astringent, four grains of the nitrate of silver, or six of the sulphate of copper, dissolved in an ounce of distilled water. The solution of alum, or of the bichloride of mercury (j.—ij. gr. to $\frac{3}{4}$ j.) may likewise be tried. MUELLER prescribes one, two, or three drops of sulphuric acid, or two or three grains of the diacetate of copper, in an ounce of water. Mr. BRIGGS states, that a minute quantity of the oleum terebinthinæ introduced between the lids every morning, on the point of a camel-hair pencil, the eye being afterwards bathed with cold water, is most efficacious in checking the profuse discharge.

51. It will be observed, from the foregoing, that some difference of opinion exists as to when the use of active astringents should be commenced. The majority of authorities, as EDMONDSTON, VETCH, MACKENZIE, LAWRENCE, JACOB, &c., resorting to local depletions, and soothing or anodyne applications, in the early, acutely painful, or active inflammatory stage, and to strong astringents, when this stage is removed, and the chronic or atonic condition has commenced; whilst some military authorities, as MELIN, O'HALLORAN, and GUTHRIE, advise the adoption of powerful astringents from the beginning. I agree, however, with the former; and with them consider, that the effects of astringents should be carefully watched, when early, or even at first employed; and, if the redness be increased by them, that they should be laid aside for a time, and antiphlogistic remedies adopted. The citrine or red precipitate ointment should be applied to the edges of the lids at night.

52. In the *dark races*, astringents ought to be early and energetically employed. Among the negro tribes, *vegetable astringents* and *stimulants*, especially lime-juice, are entirely confided in. The astringents above noticed are, however, equally appropriate in them; and the addition of anodynes, particularly opium and camphor, is also of service, with pure air, and suitable diet.

53. *Blisters* to the nape of the neck, or behind the ears, are sometimes serviceable, especially when kept open for some time. When the pain is very distressing in the acute stage, relief is afforded by the *steam of hot water*, to which *laudanum* and *camphor* have been added; and the *vinum opii* is often a useful application, when the conjunctiva

is relaxed and painful upon the disappearance of the discharge. *Evacuation of the aqueous humour* by incision has been recommended by Mr. WARDROP, in order to remove the bursting pain in the eyes and forehead, and practised in twenty-three cases by Mr. MACGREGOR, from a dread of rupture of the cornea. In the advanced stage of the disease, exercise in the open air, exposure of the eye to as much light as it will bear, and the use of *gentle tonics*, with a free state of all the excretions, are serviceable. If, after depletions, the eye becomes irritable, or the pain intermittent or periodical, the preparations of *bark*, with the *mineral acids*, as MUELLER advises will be of benefit. If *ulceration of the cornea* have commenced, a tonic and stimulating treatment is required, especially if it spread and be attended by debility. When *ectropium* of the lower lid remains after the inflammation is gone, and presents a red fleshy mass, Mr. LAWRENCE directs the application of the nitrate of silver in substance to it.

54. (b) *Treatment of the milder grades.*—If the inflammation have extended to the conjunctiva oculi, however slight, *local depletion*, *low diet*, and *purgatives* should be directed. When active disorder is removed by these, the application of *astringents* to the diseased surface of the eyelids should be entered upon, and continued until the morbid state of this part described above (§ 43.) is entirely removed. The solution of alum, or of nitrate of silver, or of sulphate of copper, the strength of which should be gradually increased, or the undiluted liquor plumbi, ought to be dropped into the eye, once or twice a day, the citrine ointment being applied to the margins of the lids at night. Exercise in the open air, free exposure of the eyes, and due regulation of all the natural functions are beneficial. MUELLER recommends mercurial ointments to be rubbed over the diseased surface of the lids once or twice daily.

55. When the *palpebral conjunctiva* becomes *altered or granulated*, in the chronic state, as above described (§ 43.), very active local means are necessary, as the irritation occasioned by the morbid surface produces vascularity and opacity of the cornea, or loosening and thickening of its conjunctival layer—or *pannus*. With the change in the surface of the eyelids, may be associated some one of the unfavourable results of the more violent attacks, as *leucoma*, *cyoecchia*, *anterior*, *staphyloma*, &c.—Mr. LAWRENCE remarks that, if the globe be free from irritation, the *astringents* already specified, particularly a solution of twenty or thirty grains of nitrate of silver in an ounce of water, should be applied to the granulated surface, with a camel-hair pencil, the lids being everted. If this be not sufficient, *escharotics*, beginning with the weaker, and proceeding to the strongest, must be used. In order to prevent their injurious action on the conjunctiva oculi, the lids should be everted, the diseased part only touched, and they ought to be kept everted until the effect is produced. The diacetate of copper, the sulphate of copper, or the nitrate of silver—the strongest—should be lightly applied to the granulated surface, previously freed from moisture; and, after waiting a minute or two, the lid should be carefully washed and restored. These applications cause severe pain,

redness, and swelling, with increased discharge, and should not be repeated until these effects have disappeared, which may not take place for five, seven, or eight days. In the intervals of the escharotics, some astringent solution may be applied. Mr. LAWRENCE and Professor WALTHER do not speak very favourably of this plan; and are more disposed to depend upon antiphlogistic means in the first instance, and the subsequent use of astringents, as above directed, with regulation of diet and of the digestive organs, residence in a pure air, exercise, and a moderate use of the organ. Rapid improvement, Mr. LAWRENCE states, sometimes has followed the substitution of soothing applications for strong astringents.

C. GONORRHOEAL OPHTHALMIA.—SYN. *Gonorrhæal Inflammation of the Conjunctiva; Specific Ophthalmia; Conjunctivitis specifica; Ophthalmia Gonorrhœica vera*, BEER.

56. *This is a violent inflammation of the mucous membrane of the eyelids and globe, attended with a profuse discharge of a fluid closely resembling that which issues from the urethra in gonorrhœa, and occurring in some kind of connection with that complaint.*—It is the most violent and rapidly destructive inflammation to which the eye is subject; fortunately it is one of the most rare. It sometimes destroys the eye within a very short time; or irreparably injures it before medical aid is resorted to, especially in the lower classes. Mr. MACKENZIE divides it into—1st, that from inoculation; 2d, from metastasis; and, 3d, without inoculation or metastasis. Mr. LAWRENCE distinguishes three forms:—*a.* Acute gonorrhœal inflammation of the conjunctiva;—*b.* Mild inflammation of this membrane;—and, *c.* Gonorrhœal inflammation of the sclerotic coat. I shall here consider chiefly the former; the third form being merely rheumatic ophthalmia, occurring, like other rheumatic affections, in connection with gonorrhœa.

57. *a. Symptoms and Progress.*—*Acute gonorrhœal ophthalmia* presents all the fully developed characters of purulent ophthalmia. Mr. LAWRENCE distinguishes three stages; which, however, are not very clearly evinced; although the division is judicious. In the *first stage*, which is short, the inflammation is confined to the conjunctiva, and is attended with a sensation of sand in the eye, and soreness, stiffness, uneasiness on exposure to light, and a thin whitish mucous secretion. Extreme vascular congestion, intense and general redness, excessive tumefaction of the conjunctiva, great chemosis, and swelling of the lids, supervene; especially as the disease approaches the *second stage*, which is characterised by a profuse discharge of thick yellow matter, closely resembling in its appearance, and in the stain it communicates to linen, the gonorrhœal secretion. When the discharge is established, the inflammation causes effusion into the cellular tissue connecting the conjunctiva to the surrounding parts. Hence the very remarkable chemosis, which is sometimes so extreme, as to overlap or hide the cornea; and the palpebral swelling and enlargement, which is occasionally very great. The affection soon extends to the cornea, constituting the *third stage*, with agonising pain in the globe, orbit, and head, augmented on exposure to light, and attended by

symptomatic inflammatory fever. The danger to the organ is now most imminent. The swelling of the lids and chemosis render it difficult, or even impossible, to obtain a view of the cornea. When this is the case, attempts to attain this end should not be made so as to increase the symptoms. Although pain is most acute in both the eye and head, as in other instances when the unyielding cornea is the seat of inflammation; and although patients often complain of burning pain, of tension as if the eye would burst, with deep-seated suffering extending to the brow, forehead, and head, there are some instances in which little or no pain is felt. The symptoms are, however, not equally violent through the whole course of the complaint; and the *duration* of the *stages* varies with the constitution and health of the patient, and the treatment adopted. The *first* and *second*, particularly the first, usually passes away rapidly.

58. *b. Consequences.*—The immediate effects of the inflammation on the cornea are sloughing, suppuration, ulceration, and interstitial deposition; these changes leading to escape of the humours and collapse of the globe, obliteration of the anterior chamber, and flattening of the front of the eye, staphyloma, prolapse of the iris, obliteration of the pupil, opacity of the cornea, and anterior adhesion of the iris. Sufficient notice has already been taken of each of these lesions; as they do not differ from those supervening upon the other varieties of purulent ophthalmia, although they more rapidly appear, and in severer forms, than in them.

59. *c. Diagnosis.*—The severest grade of *purulent ophthalmia* closely resembles the acute *gonorrhœal*. In the latter, however, the swelling of the conjunctiva oculi is greater, and that of the eyelids somewhat less, than in the former. The discharge, however, is thicker, and perhaps more abundant, and the constitutional disturbance greater, in the gonorrhœal, in which the peculiar granulated change of the conjunctiva of the lids does not occur. In purulent ophthalmia, the disease begins in the lids, and advances gradually; but in the gonorrhœal, it seems to commence in the conjunctiva oculi: in one case, Mr. LAWRENCE saw it distinctly begin there; and it attacks most violently and proceeds most rapidly. The former generally continues long, affects both eyes, remits, or returns, rarely destroys the eye by sloughing, and is much less destructive; whilst the latter more frequently affects only one eye, and the cornea is much oftener destroyed by sloughing. This disease is uncommon, occurs in single instances, and in persons who have had, or who still have, gonorrhœa; whilst purulent ophthalmia usually affects numbers, particularly when many live together.

60. *d. Prognosis.*—Nine cases out of fourteen related by Mr. LAWRENCE in his treatise on this disease, were seated in one eye; out of the fourteen, loss of vision took place in nine cases from sloughing, suppuration, or opacity of the cornea. In two cases, one eye was lost, and the other recovered. Sight was restored in the other five, with partial opacity of the cornea and anterior adhesion of the iris in three of the number. This writer adds, that so short a period intervenes between the commencement and full development of the complaint, that irreparable mischief

is generally done to the eye before aid is resorted to. In the *first* or *second* stage, its progress may be arrested; but success even thus early must not be reckoned upon. If the cornea still possess its natural clearness, the eye may be saved; but if it have become hazy or dull, and particularly if it be white or nebulous, serious consequences will ensue. Sight may, however, be restored after partial sloughing of the cornea; and ulceration may occur in its circumference without injury to vision. When both eyes are successively attacked, the disease is often less severe in the second, which, therefore, is saved; but exceptions to this occasionally occur, the sight of both being lost.

61. *c. Causes.*—Dr. VETCH found that the matter of acute purulent ophthalmia, applied to the urethra of the same individual, excited no disease; but that, when it was applied to the urethra of another person, it produced a virulent gonorrhœa: he therefore infers that the matter from the urethra, coming in contact with the eye of the same individual, would not occasion gonorrhœal ophthalmia. But Mr. MACKENZIE, Mr. LAWRENCE, and Dr. JACOB, adduce cases from their own practice, which were produced in this way, and refer to others from WARDROP, ASTRUC, ALLAN, and FOOT. It has been incidentally mentioned by SCARPA and BEER, that gonorrhœal matter applied to the eye excites only slight inflammation; but they do not refer to the source whence it was derived—whether from the same person or from another—the cases observed by LAWRENCE and the other writers just mentioned, show that this statement does not hold in respect of the same person, and that he may infect himself, although such infection is not so frequent, as the inattention of gonorrhœal patients, particularly in the lower classes, would lead us to expect; and the experience of WARDROP, DELPECH, BACOT, ALLAN, and MACKENZIE fully proves that the disease may be caused by the application of gonorrhœal matter from a different person, although, for obvious reasons, this cannot be a frequent occurrence. It is, therefore, placed beyond doubt, by the cases observed by the above writers, that the complaint may be caused by the contact of gonorrhœal matter—1st, from the same individual, and, 2dly, from another. But as, in the greater proportion of cases of gonorrhœal ophthalmia, no application of matter, either from the same or another individual, can be traced, in what other way does the disease arise? It has been very generally imputed to metastasis in all such; and the discharge from the urethra has been said to be suppressed by ST. YVES, RICHTER, SCARPA, and BEER, but erroneously, as contended by DELPECH and LAWRENCE. In the cases which this last writer has recorded, the discharge was not stopped in any one, although it was generally lessened, but in some not at all. He therefore concludes that, since the complaint may occur while the discharge from the urethra continues, and since it does not take place when that discharge is stopped, we cannot admit that it owes its origin to the cessation of the urethral discharge. This supposed metastatic form he refers to the state of the constitution, considering it as analogous to those successive attacks of different parts which are observed in gout and rheumatism; and he

remarks that, although direct infection operates equally on the eyes of both sexes, this particular form seems confined to the male. BEER says that he has observed it only in young, robust, and plethoric men.

62. *f. Treatment.*—The antiphlogistic plan, and particularly vascular depletion, has been carried to the utmost extent, sometimes with complete, but as often with only partial, success. Of six cases which Mr. LAWRENCE saw at an early period, and treated by *extensive depletion*, general and local, loss of the eye occurred in one only,—a most satisfactory evidence of the propriety of the practice. But whenever the disease comes late under treatment, no plan can succeed, so violent and rapid is the disease. The application of strong astringents and escharotics to the eye, in order to arrest its progress, has been advised, as its consequences have been so destructive to the organ; and the nitrate of silver ointment, already described (§ 49.), has been recommended by Mr. GUTHRIE. The success of this practice in the severe purulent ophthalmia, warrants its adoption in this; and active depletions, found so successful by Mr. LAWRENCE, in an early stage, may precede it. One circumstance, however, may militate against our inferences in favour of it, namely, the original and principal seat of disease being in the palpebral conjunctiva, in purulent, and in the conjunctiva oculi, in gonorrhœal, ophthalmia, the pathological states are not therefore the same in both. Notwithstanding, both modes of practice may be conjoined with advantage, as Dr. JACOB suggests. The oleum terebinthinæ, dropped into the eye, is deserving of trial.

63. Large and repeated bloodlettings from the arm or jugular vein, followed by local depletion and the remedies above advised (§ 62.), are, in the present state of our knowledge, most to be depended upon. But if sloughing or suppuration of the cornea have occurred, this treatment will be of no service. Mr. LAWRENCE has seen mercury employed without any advantage, and he places no reliance on the reproduction of the urethral discharge, as advised by RICHTER, SCARPA, and BEER. He also thinks blisters to be of little use. The eyes should be very frequently cleansed by the usual means. When the inflammatory symptoms have been completely and quickly subdued, the effects will pass off in a little time without astringents and tonics; but when the conjunctiva becomes pale and flabby, and the patient pallid and weak, the purulent discharge being still abundant, astringents locally, and tonics internally, are usually recommended. When sloughing or ulceration of the cornea is attended by signs of great depression, quinine and generous diet are necessary, and astringent lotions are sometimes of service. Mr. LAWRENCE prefers a solution of from two to ten grains of alum in an ounce of water, the solution of the nitrate of silver, and undiluted liquor plumbi di-acetatis.

64. *g. Mild gonorrhœal Inflammation of the Conjunctiva.*—Mr. LAWRENCE has described a very slight variety of gonorrhœal ophthalmia, consisting of external redness of a bright scarlet tint, with distension of the superficial vessels of the globe, and increased mucous secretion. In still slighter attacks, the redness is not deep nor gene-

thereby occasioned, the child rubs or scratches the parts, which become sore and pustular, and produce a discharge which encrusts; the affection ultimately extending over the face and forehead, and in its worst form resembling *crusta lactea* and *porrigo larvalis*. The edges of the lids are often red, swollen, and painful. There are sometimes an acrid secretion from, and excoriation of, the nostrils; with redness and swelling of the *alæ nasi* and upper lip. The ears are frequently red and sore, or excoriated behind, and the absorbent glands of the neck are swollen. The bowels are constive, the tongue white or furred, the abdomen distended, the breath foetid, the appetite is morbid, the head and sometimes the skin are hot, and the child is restless and grinds its teeth when asleep. The symptoms are worse during the day, but remit somewhat in the dusk of evening. The inflammation of the eye may suddenly subside, and return as suddenly; and very slight exciting causes will bring back the complaint; which may thus continue with slight intermission for months, or even for years. The affection of the eyes may also alternate with some other disorder, or symptoms in remote parts. In the more chronic cases, the health suffers greatly from seclusion from light, air, and exercise; and the patient becomes pale, etiolated, and sickly, with a dry and harsh skin.

72. *c.* The *Consequences* of the disease on the cornea are often serious, although the external redness may not be great. The phlyctenular or pustular elevations in the cornea may subside, leaving *slight opacity*, or considerable thickening of the corneal conjunctiva with greater and more permanent opacity; but they more commonly *ulcerate*, in an irregular form, and with a ragged edge, the ulcers sometimes extending superficially, or making their way through the cornea to the anterior chamber, occasioning prolapse of the iris. The vessels passing over the cornea may, without forming pustules, occasion thickening and opacity, which may proceed so far as to render the whole corneal covering thick and vascular (*Pannus*). *Opacity* from interstitial deposition may also occur, either with or without enlargement of the proper corneal vessels; and, according to Dr. FRONIEP, a brownish red discolouration, from interstitial effusion of blood, may supervene. In addition to the opacity, the external layers of the cornea may yield from the pressure from behind, and form an external protuberance (*Staphyloma*); or adhesion of the iris to the internal surface of the cornea may take place. In some instances, the inflammation extends to the sclerotic coat and iris, and even to the parts seated behind them. This occurs most frequently in prolonged or after repeated attacks; and occasionally is followed by structural change of these parts, or by dropsical enlargement of the globe.

73. *d.* *Diagnosis.*—The extreme intolerance of light, and copious flow of tears in connection with the trifling external redness, the pustular elevations of the conjunctiva, sufficiently distinguish this affection, which frequently, also, co-exists with enlargement of the glands and scrofulous irritation of the nostrils, lips, behind the ears, and in other parts of the body. In many instances, however, of conjunctivitis in children,

it is difficult to draw a distinction between the common and scrofulous forms of the disease; the characters of the one gradually merging into those of the other. This is more especially the case when the affection of the eyes is associated with, or consequent upon, either acute or chronic cutaneous eruptions, particularly such as affect the scalp and face.

74. *e.* The *Prognosis* is *favourable*, if the cornea be not affected, or if superficial or slight opacity, owing to deposition between its laminae, only be present. Mere vascularity of the cornea will disappear; but if it be attended by thickening and opacity, the change will be more or less permanent. If ulceration have taken place to considerable depth or extent in the cornea, and especially if it be accompanied with affection of the iris, or lesion of the sclerotic coat, vision will be more or less impaired.

75. *f.* *Treatment.*—*a.* Constitutional or internal means are most important in this complaint. After the bowels have been freely evacuated, a course of *tonics* should be prescribed, with *alteratives*, to promote and improve the various secretions. A full dose of *calomel* and *rhubarb*, and afterwards equal quantities of the compound infusions of gentian and senna, or the compound decoction of aloes, repeated according to circumstances, will be most serviceable. In some cases, an *emetic* will advantageously precede the purgatives. Having thereby evacuated morbid matters, and excited the secreting and excreting viscera, tonics, especially the *sulphate of quinine*, will be productive of the greatest benefit. During the course of tonics, the *hydrargyrum cum creta* should be given on alternate nights, with the carbonate of potash and rhubarb or jalap. If the skin be pale, or the child languid and etiolated, the *preparations of iron*—especially the *tinctura ferri ammonio chloridi*, the *vinum ferri*, the *ferrum tartarizatum*—may be preferred. An electuary of sesqui-oxide of iron, confection of senna, and treacle, may occasionally be substituted—particularly on the day following that on which the powder was taken. In some instances, the decoction of bark, with *sulphuric acid* may be alternated with these tonics, especially after mercurials have been laid aside. *Cascarella* with soda, or any of the tonic infusions, with small doses of the *chlorate of potash*, may likewise be tried.

76. *β.* *Regimen* and *diet* are most important items in the treatment. The patient should be warmly clothed, and take regular exercise in the open air, particularly when it is dry and bracing. Change of air, occasionally to the sea-side; and warm, tepid, or cold bathing, are also beneficial. In weak or irritable children, warm or tepid bathing, salt having been added to the water, or in sea water, should be first adopted; and cold bathing tried as the health improves. The diet should be duly regulated; animal food in moderate quantity, suitable vegetables, and ripe baked fruits, being allowed; but all fermented liquors, indigestible substances, and rich crusts or pastry ought to be withheld. The usual farinaceous food should always constitute a chief part of the diet. The child ought to wear through the day a dark shade before the eyes; and sleep in a dark but well-aired room, with the head considerably raised.

experience—should alone decide the question. Although my experience in this matter has necessarily been limited of late years, yet have I seen enough even of this complaint, to convince me that fomentations with emollient and anodyne substances are superior to those which are simple—which consist only of warmth conjoined with humidity. Therefore, when the pain and intolerance of light are great, the disease somewhat advanced, or even established, warm emollient and anodyne applications ought to be preferred. SCARPA directs mallows boiled in fresh milk as a fomentation; or emollient and anodyne vapours, to be conveyed to the eye through an inverted funnel. Mr. MACKENZIE directs *opiate frictions* of the forehead and temples, and the eye to be kept under the influence of *belladonna*. Fomentations with a decoction of poppy-heads and camomile flowers, or marshmallows; and the vapour of warm water, to which camphor and the watery extract of opium have been added; are generally beneficial in the circumstances just stated. Dr. SMITH remarks, that when the pain was not alleviated by bloodletting or by fomentations, much and lasting relief was procured by exposing the eye, twice or thrice daily, to the steam arising from the following mixture brought to a boiling heat. It is now eighteen years since a nearly similar combination, but with much more opium and camphor than is here ordered, was prescribed by me with great relief in a case of the disease.

No. 219. — R. Mist. Camphoræ ʒij; Tinct. Opii ʒ ss; Liq. Ammon. Acet. ʒij; Aq. Rosar. ʒiv. M.

95. *β. The sub-acute and chronic states*, especially the former, sometimes require either *venæ-section*, or full cupping, particularly in young or robust persons. In most instances, *leeches* should be applied to the vicinity of the eye; and sometimes either they or cupping ought to be repeated oftener than once. Purgatives should be freely employed; and, if the tongue be loaded, and the evacuations offensive, an *emetic* should precede them. Great attention ought to be paid to the diet; and animal food must be taken only in small quantity or nearly relinquished. Counter-irritation is generally beneficial; and either open blisters, pustulation by means of tartar emetic, setons, or issues, should be directed to the nape of the neck, behind the ears, or to the temples. During treatment, the bowels should be freely opened by stomachic purgatives, particularly if the tongue be loaded, and the discharges morbid; and the regimen as well as the diet rigorously restricted. If the above treatment have been actively employed, the complaint will be removed, without the necessity of resorting to *astringent* or *stimulating applications*. But, in neglected cases, they are sometimes very beneficial, especially if the affection of the conjunctiva be considerable, after the above measures have been appropriately prescribed, and when the complaint is far advanced, or in a chronic state. The *vinum opii*, dropped into the eye, was recommended by Mr. WARE; and is suited chiefly to chronic cases. The liquid laudanum of SYDENHAM (F. 729.), or preparations similar to it, may also be applied. The collyrium praised by CONRADI, and which consists of one grain of bichloride of mercury dissolved in six ounces of rose water, with the addition of a drachm of

mucilage of quince-seeds and half a drachm or a drachm of SYDENHAM's laudanum, is often of service. Several other applications, some of them much more astringent than the above, have been recommended; but they are undeserving of particular notice. The astringent ointments, and solutions found so beneficial in the treatment of conjunctivitis (§ 16.50.), may also be employed in the chronic states of this complaint, particularly under the circumstances just specified.

96. *B. RHEUMATIC, CATARRHO-RHEUMATIC, AND ARTHRITIC OPHTHALMIA.* SYN. — *Ophth. Rheumatica et Arthritica.* — *Scleritis Rheumatica et Arthritica.* — *Inflammation of the External proper Tunics in Rheumatic and Gouty Constitutions.*

97. *a. The Rheumatic modification of ophthalmia.* — *Scleritis Rheumatica or Atmospheric of MACKENZIE*—is seated in the external proper tunics of the eye, as in the common, or phlegmonoid, variety just described. The conjunctiva is only slightly affected; but the inflammation sometimes extends to the iris, or cornea, or to both, but generally in a slight degree. It is commonly caused by cold, or currents of air striking the eyes of persons of a rheumatic diathesis. It is not a common affection, and seldom arises from metastasis.

98. *b. Symptoms and Course.* — A stinging or tearing pain is complained of in the eye, increased by heat and by a warm bed, and extending to the orbit and adjoining parts of the head and face. The sclerotica is of a rose red, and shines through the conjunctiva, which is more injected than usual. There is an increased flow of tears, aggravated by changes of temperature. The pain subsequently becomes more dull and aching, extends with greater severity to the neighbouring parts, and lachrymation is augmented. The intolerance of light, which was only slight, is afterwards felt only in a strong light. Dullness or haziness of the cornea is frequently observed, but is seldom followed by any serious change. Sometimes *phlyctenule* appear in the conjunctiva oculi and cornea, but they do not often pass into ulceration. The biliary and intestinal functions are more or less disordered; and febrile disturbance is commonly present. The severity and duration of an attack vary very much. Slight cases soon subside; but severer attacks may give rise to iritis, which is, however, rarely acute, unless the disease be neglected, when it may go on to effusion of coagulable lymph. Rheumatic scleritis is not attended by affection of the lids, nor by chemosis: it does not give rise to suppuration, and rarely to ulceration, the ulcers being small or peculiar, and healing readily; and it sometimes lapses into a very chronic, slight, or recurring form.

99. *c. The Catarrho-rheumatic ophthalmia* of some writers does not differ materially from the common or phlegmonoid inflammation of the proper external tunics (§ 86.), being seated in the sclerotica and conjunctiva. It is usually caused by cold, and atmospheric changes; and in the rheumatic diathesis, very nearly approaches, or merges into, the rheumatic form; the only difference being in the greater affection of the conjunctiva, and in the consequent manifestations of certain catarrhal symptoms.

100. *d. Arthritic Ophthalmia* — *Scleritis Arthritica.* — *Arthritic external Ophth.* — or inflam-

cornea is penetrated either by ulceration or suppuration, the aqueous humour escapes, the iris and cornea coming in contact. When the wound in the cornea is small, it unites by adhesion, and the aqueous humour is soon reproduced; but when it is large, prolapsus of the iris often results.

107. *b. Sub-acute and chronic Corneitis* are common in young persons of a fair complexion and delicate constitution. The cornea loses its transparency, presents a dull grey colour, or becomes hazy, nebulous, or nearly opaque; the opacity commencing at the circumference, and gradually but unequally extending. The nebulous and opaque spots are sometimes yellowish, as if matter were formed: and the surface loses its polish, and seems rough. The circumference of the cornea is minutely injected with a multitude of very fine vessels, which impart to it a reddish brown tint, and occasionally elevate it somewhat. The conjunctiva often retains its natural paleness, but the sclerotica is minutely injected, particularly around the cornea. As the brownish red tint of the circumference of the part increases, the opacity in its centre becomes greater, and vision more affected. There is generally much intolerance of light, notwithstanding the diminished transparency of the cornea, owing to affection of the sclerotica. A partial form of corneitis, which is generally of very long duration, is sometimes met with. Inflammation commences in one or two spots at the circumference of the cornea, with pain of the eye, and nebulosity; others being affected in succession. Redness is first observed in the sclerotica, in one or two points; and minute vessels extend from these into the cloudy spots in the cornea; more or less of which may become thus affected, or entirely opaque.

108. Although the severe and acute grades of corneitis often run into suppuration or ulceration, the slighter or more chronic states do not terminate in this manner, excepting in sub-acute cases, where partial or circumscribed points of suppuration may occur. The more severe grades are attended by much pain in the eye, temples, and forehead; with tension of the organ, white tongue, and febrile disturbance, particularly at an early stage; and they often pass into the slighter and chronic states; but the latter also occur primarily. Chronic corneitis presents much less febrile disorder than the acute, and often continues for several months, or remits. The inflammation sometimes extends to the iris, occasioning adhesion of its margin to the capsule of the lens.

109. *c. Scrofulous Corneitis* — *Corneitis scrofulosa*. — Inflammation of the cornea in scrofulous habits has been minutely described by Dr. FRORIER and Mr. MACKENZIE; but its local characters do not differ from those of the sub-acute and chronic forms noticed above (§ 107, 108.), excepting that it is more obstinate, and more liable to return. It is sometimes unattended by redness of the sclerotica; and the pain is not considerable. It is most common about the period of puberty, and is occasionally connected with amenorrhoea in the female, and with swollen lymphatic glands. In the more obstinate cases, increased secretion of the aqueous humour, and consequent enlargement of the anterior chamber, occasionally supervene.

110. *d. Treatment*. — *a. Acute corneitis* requires active depletory and other antiphlogistic measures. Cupping behind the ears or on the tem-

ples is always necessary. Purgatives, and afterwards calomel with James's powder, and occasionally with opium, until the mouth is affected, are beneficial, especially if the iris be inflamed. In the more obstinate and chronic cases, cupping, or the application of a number of leeches to the vicinity of the eye, should be repeated oftener than once, and be followed by open blisters, setons, or issues. Mr. LAWRENCE advises issues to be inserted in the temples. Astringent and stimulating applications to remove the opacity are generally injurious. Warm fomentations are more serviceable, particularly with emollient and anodyne substances. Emetics, if the digestive organs be loaded; and diaphoretics, assisted by warm pediluvia, if the skin be dry, and fever present; are also useful. — *β. The scrofulous variety*, especially its more chronic states, is benefited most by sarsaparilla, sulphate of quinine, decoction of bark with liquor potassæ, the compound myrrh mixture, the iodide of potassium, and by small doses of the bichloride of mercury in tincture of bark. — As this variety often continues many months, perseverance in the use of these means, and changes from the one to the other, a dry warm air, and change of air, with attention to the state of the digestive organs, and a carefully regulated diet, are most requisite.

III. INFLAMMATION OF THE INTERNAL PARTS OF THE EYE. SYN. — *Internal Ophthalmia, Ophthalmitis Interna, Auct. var.*

111. DEFIN. — *Inflammation of one or more of the internal tissues of the eye, occurring either primarily, or consecutively of external disease, and attended by impaired vision, and frequently by constitutional disorder.*

112. In diseases of the internal eye, artificial dilatation of the pupil is necessary both to the investigation of their nature and extent, and to their treatment. Mr. LAWRENCE has given a learned account of the agents by which dilatation may be accomplished. Various narcotic vegetables possess this power, but belladonna in the highest degree. The tincture, extract, decoction, infusion, or powder of this plant may be employed for this purpose, either internally, or dropped into the eye, or rubbed on the brow or temple. Hyoscyamus is the next powerful substance. An aqueous solution of the extracts of either may be rubbed or placed upon the eyelids or parts in the vicinity, and washed off after remaining for about an hour; or it may be dropped into the eye, when a speedy and certain effect is desired.

i. INFLAMMATION OF THE ANTERIOR CHAMBER. SYN. — *Inflammation of the Capsule of the Aqueous Humour, WARDROP; Aquo-Capsulitis, MACKENZIE; Kerato-iritis, ROSAS; Inflammation of the Anterior Chamber, LAWRENCE.*

113. CHARACT. — *Diffused muddiness, or mottled appearance of the cornea, dimness of vision, fullness and tension of the eye, dullness of the iris, slightly contracted pupil, headache, white tongue, and fever.*

114. Inflammation of the membrane of the aqueous humour is often consequent upon the varieties of ophthalmia already described; but is also a primary disease, and is most common in this form among children. It cannot be considered, even when primary, to be confined to the anterior chamber, or to this membrane. The

arthritic diathesis, or supervening in the course of syphilitic cachexia.

121. *Causes.*—*Primary Iritis* occurs most frequently in persons of an unsound constitution—the gouty, rheumatic, and cachectic; and hence it presents certain modifications hereafter to be noticed. It rarely occurs in young and healthy persons; although it may supervene in them, upon the other varieties of ophthalmia. It is excited by the common causes of inflammation of this organ (§ 5.); especially by over exertion, and employment of sight on minute or bright objects; by external injuries or operations on the eye; and by exposure to cold, wet, and atmospheric vicissitudes. These last are the common exciting causes in persons imbued with the syphilitic cachexia, and in those of a rheumatic and gouty diathesis. I do not believe that the use of *mercury* will cause the complaint, if it be given so as to affect the mouth.

122. *A. IDIOPATHIC IRITIS.*—*a. Symptoms and Course.*—Iritis presents various grades of severity, and periods of duration. It may hence be mild or severe; acute, sub-acute, or chronic. I shall adopt Mr. MACKENZIE'S division of iritis into three grades.—*a. In the first degree*, the vascularity of the sclerotica is barely perceptible, and exists only in one or more points, and chiefly behind the upper lid. The ring of the iris next the pupil is slightly discoloured; the pupil is not materially contracted, but is somewhat irregular, without its usual clean and sharp edge, and is hazy; and the motions of the iris are limited and slow. Vision is confused and slightly obscured. There is little or no pain, or aversion from light. This state of iritis may exist for many weeks, and yet be completely removed by suitable treatment.

123. *β. The second degree*, or that with evident external inflammation of the eye, is much more frequent than the foregoing. A zone of vascularity is observed in the sclerotica around the cornea, the vessels sinking through the sclerotica, and not advancing into the cornea. The iris, particularly its inner or smaller rings, is discoloured, either from injection of its vessels or the effusion of lymph; and its anterior surface, instead of being smooth and shining, appears dull, puckered, and swollen, especially near the pupillary opening, where it is retracted towards the lens. The pupil is contracted, irregular, motionless, and filled with coagulable lymph, which generally appears like half-boiled white of egg. Epiphora and intolerance of light are considerable, and vision becomes greatly impaired. The pain in the eye is constant, and attended by pain in the orbit and forehead, particularly at night; and by the usual symptoms of inflammatory fever.

124. *γ. The third degree* of iritis presents the following characters:—The eye externally is much more inflamed than in the foregoing grades; the redness of the conjunctiva being sometimes so great as to mask for a time the red zone of the sclerotica. Both the smaller and larger rings of the iris are discoloured; the anterior surface being swollen, puckered, and bolstered forwards so as to approach the cornea, excepting its pupillary edge, which is retracted towards the lens. Red vessels and spots of blood are sometimes seen on the iris, but more fre-

quently in the lymph occupying the very contracted pupil. One or more minute elevations, of a yellowish colour, which are in some cases specks of effused lymph, in others small abscesses, appear on the surface of the iris; and pus discharged from these abscesses, with lymph, blood, and serum, sometimes occupy the anterior chamber. The cornea becomes hazy and turbid, and occasionally dotted with minute brownish spots. There are at first great intolerance of light and lachrymation; and subsequently vision is completely, and generally permanently, lost. Flashes of light in the eye are frequently perceived by the patient, indicating the extension of inflammation to the choroid and retina. The pain in the organ is constant, great, and sometimes excruciating; with pain in the orbit and eyebrow, increased at night. When attended with extreme pain, especially in syphilitic cases, very serious changes, even abscess of the anterior chamber, disorganisation of the vitreous humour, &c. frequently supervene. In them, the inflammation is extended more or less to the internal and external tissues of the eye, and general ophthalmitis (§ 153.) is the result.

125. *δ. The discolouration of the iris* arises from vascular injection and effusion, and is of a yellowish or greenish tint, in light eyes; or of a reddish hue, in dark eyes: but it is very frequently dull, muddy, and dark; and the natural brilliancy and fibrous arrangement of this part are lost. The effused lymph is seen first at the pupillary edge, and afterwards on the lesser circle of the iris; causing a villous, rough, elevated, or irregular surface or outline of the part. The lymph may be in distinct masses of very various sizes on the anterior of the iris, or at its pupillary margin; and, in the most acute cases, it may fill the pupil or anterior chamber, or even the posterior chamber. The colour of the effused lymph is sometimes a light yellowish brown or ochrey; but a rusty hue is most common. It is occasionally of a light dirty yellowish tint, particularly when it is abundant, and fills the anterior chamber. In this case, or when a small abscess in the iris is discharged in this situation, a form of hypopyon is the result. The pupil is contracted, and becomes more and more so in the progress of the complaint. The effusion of lymph and adhesion render it also angular, irregular, and fixed at one or more points, and free in others. It loses its thin, sharp, and well-defined edge; and becomes dull and cloudy, or otherwise discoloured.

126. *ε. The acute states of iritis* are observed in persons of a full habit or robust constitution, after the action of powerful causes, especially if they continue to act, and the case have been neglected at the beginning; and in cachectic conditions of the frame. They are attended by the usual characters of severe vascular action; especially injection of the vessels, extreme contraction of the pupil, effusion of lymph, dulness of the cornea, external redness, loss of sight, violent pain in the eye, and severe headache, with watchfulness, restlessness, and febrile disturbance, terminating, in a few days, in disorganisation of the interior tissues, and in irreparable loss of vision.—In chronic cases, the origin of disease is almost imperceptible, and its progress slow. Little or no pain is felt, and the external

of turpentine and castor oil, or a larger portion of the former, the specific operation of the calomel will not be prevented, or even delayed, but the beneficial effects on the disease will be insured.

131. *Belladonna* is of great benefit in every stage of the complaint, and should be applied as directed above (§ 112.), contemporaneously with the exhibition of mercury. Although the pupil be contracted, and effusion or even adhesion has taken place, the specific operation of the latter, and the effects of the former on the iris, will elongate or even entirely detach the adhesions, if they are soft or unorganised. In addition to these, *diaphoretics*, *diuretics*, and warm pediluvia are beneficial. The bowels ought to be kept freely open by the substances already noticed. Turpentine may be used for this purpose, or with the view of aiding the effects of calomel, or even as a substitute for it, as advised by Mr. CARMICHAEL, who prescribes it in drachm doses, three times a day, suspended in almond emulsion. Blisters are of doubtful efficacy; Mr. LAWRENCE decides against them.

132. *B. SYMPATHETIC IRITIS.*—*a. Syphilitic Iritis*, or inflammation of the iris occurring in persons tainted by the syphilitic poison, is, perhaps, the most common variety of this disease. It is a symptom of syphilis in its constitutional stage; and, although sometimes appearing alone, it is more frequently one of several secondary symptoms, especially ulcerations of the throat, eruptions, swellings of the periosteum, pains of the limbs, affection of the nose, &c. It occurs most frequently along with the earlier secondary affections, and sometimes appears before the primary disorder is cured (LAWRENCE). It rarely occurs as a symptom of syphilis in infants, although secondary syphilis is not infrequent in them. It may be either *acute* or *chronic*; it is often associated with inflammation of other internal tissues of the organ; and it is most commonly determined or excited by exposure to cold, exertion of the eye, or external injury.

133. *Diagnosis.*—The characters and progress of syphilitic iritis are nearly the same as those of the idiopathic form; yet there are certain points of difference, which are frequently observed in the local symptoms, deserving of notice. These are the tubercular disposition, and the reddish brown discolouration of the lymph effused on the iris; the angular form of the pupil, and its displacement towards the root of the nose; and the violent exacerbations of pain felt chiefly in the brow during the night, and in a slighter degree or not at all in the day. The first and second of these are, however, not constant; the last is always present. But the most certain diagnosis are, the concomitance of other syphilitic affections, and the history of the case.—Lymph is effused from the margin of the pupil in *arthritic iritis*, but not deposited in a distinct form, and the adhesions are generally white; and both in it, and in the idiopathic variety, the pupil commonly retains its circular figure and central position.

134. *b. Arthritic Iritis.*—Inflammation of the iris is frequent in the *gouty diathesis*, but less so in the *rheumatic*, unless as a consequence of rheumatic inflammation of the sclerotica (§ 97.). In the *gouty*, it occurs most commonly in the iris from the commencement, although often some

other tissues of the organ are affected at the same time; but, in the *rheumatic*, it rarely begins in the iris. The *gouty modification* is generally *acute*, and very severe; the *rheumatic*, *sub-acute*, or *chronic*, and more mild.—The *former* generally commences with pain of the eye, intolerance of light, lachrymation, and zonal redness of the sclerotica. Pains are felt in the orbit, brow, and forehead. The iris soon becomes dull and discoloured; the pupil contracted, and fixed at one or more points to the capsule of the lens. The reddish zone in the sclerotica is of a dull or nearly livid tint, and does not advance to the edge of the cornea, but leaves a narrow white ring between. After a violent attack, with impaired vision, the symptoms subside, and sight is restored, the iris being attached to the capsule by whitish adhesions. This form of iritis often returns again and again, the eyes recovering almost completely after repeated attacks. Mr. LAWRENCE met with a case in which the disease returned fourteen times; yet vision was not materially impaired, though adhesions in each eye connected the pupillary edge of the iris to the capsule. But frequently a fresh effusion attends on each attack, until the pupil is more and more contracted, and at last filled with opaque adventitious membrane; the texture of the iris, notwithstanding, generally remaining but little altered.

135. *c. Scrofulous Iritis.*—This variety is consecutive of strumous ophthalmia (§ 68.), the inflammation extending from the external tunic. It is commonly preceded and accompanied by changes in the cornea, preventing the lesions of the iris from being observed. Hence it often escapes detection until it has completed its course. It very rarely occurs as a primary affection. Mr. MACKENZIE adduces a case in which the attack seemed primary; but its history is not conclusive on this point.

136. *Treatment.*—*a.* The syphilitic variety requires *local bleedings* and *mercurials*, as advised for the idiopathic disease, and in similar combinations, until the symptoms and the constitutional malady, on which the local one is engrafted, are entirely removed. Turpentine may also be employed as an auxiliary, and to open the bowels, either as directed by Mr. CARMICHAEL, or as prescribed by myself (§ 130. 131.). *Opium frictions* around the eye, and *belladonna*, are also of great service. *General bloodletting* is seldom well borne in this variety, unless in robust or plethoric persons; but full or repeated cupping is often necessary.

137. *b. Arthritic Iritis.*—The *rheumatic modification* requires the treatment recommended in rheumatic inflammation of the external tunic—especially *cupping*, *leeching*, *blistering*, *alteratives*, with *colchicum*; and, subsequently, *cinchona* or *quinine*, with full doses of *colchicum*, aided by counter-irritation. Turpentine is also beneficial in this variety; but it should be given so as to act moderately on the bowels. Mr. WALLACE advises *bark* to be given from the commencement, when this disease follows low fever.—The *gouty modification* will be removed by a very similar treatment to that now stated. *Mercurials* given with any other intention than that of removing morbid secretions and excretions, are more injurious than beneficial. *Colchicum*,

roid, of the hyaloid membrane, of the capsule, &c., under the terms *Choroiditis*, *Hyaloiditis*, *Capsulitis*, and *Lentitis*—have been described by JUNGKEN, ROSAS, and MACKENZIE. But admitting, from analogy, that inflammation may commence in, and be more or less confined to, either of these tissues, for a longer or shorter time, I question the possibility of their being often distinguished from *retinitis*, with which they must necessarily be in some degree associated. I must refer the reader to the observations of Mr. MACKENZIE on *Choroiditis*. He believes that the choroid, although generally affected consecutively upon *iritis*, is sometimes *primarily* and separately inflamed. The inference is most probably correct; yet experience shows that such a state of disease can but rarely be recognised. He states that *choroiditis*, in its earliest stages, exists without any signs of disease of the iris, and without any effects upon the sclerotica and retina beyond those which must necessarily arise from the pressure of an inflamed and swollen membrane. The dark colour of the choroid shows through the sclerotica, which thus appears bluish or purplish, and distended. The part most discoloured protrudes, generally, on one side of the ball, and near the cornea; and is of a deep blue tint, with varicose vessels running over it (*Sclerotic Staphyloma*). Several such tumours may surround the cornea, or may protrude on the posterior hemisphere of the organ. A watery fluid is sometimes effused between the choroid and the retina during its progress; and redness is observed in parts of the sclerotica. Although the iris is not inflamed, it is always narrowed or drawn towards the portion of the choroid chiefly affected, causing displacement of the pupil. There are generally attendant intolerance of light, pain, hemicrania, frequently partial opacity of the cornea, dimness of sight, proceeding to total blindness, and febrile disturbance, disorder of the digestive organs. The disease is most common in the scrofulous diathesis; in those who over-use their eyes, without taking sufficient exercise, and who expose them to too much heat and light.

145. *b. The Treatment* consists of copious blood-letting, active cathartics, mercury aided by turpentine, and counter-irritation, in the earlier stages; and, subsequently, the internal use of the preparations of iodine, or the precipitated carbonate of iron; or the iodide of iron, and the sulphate of quinine.

146. *C. Arthritic Inflammation of the Internal Tunics—Ophthalmitis Arthritica*, BENEDICT and ROSAS.—*a. Arthritic iritis* frequently is confined to the iris; but in gouty persons of very impaired constitution, inflammation is either extended to, or almost simultaneously appears in, the retina, the choroid, the lens and its capsule, and the vitreous humour; the sclerotica and cornea being secondarily affected. It usually attacks elderly persons, of a full habit, with bloated, red, purple, and veined faces; and it generally terminates in loss of sight, with dilated pupil and opaque lens or glaucoma. At first the patient complains of increased sensibility to light; of lachrymation; and of a severe burning or tearing pain deep in the globe, with a sensation as if the eye were too large for the orbit. A dull and livid redness is observed in the sclerotica; it increases towards the cornea, but is separated from this part by a narrow white ring. The conjunc-

tiva afterwards becomes injected, and the cornea dull. The pain is now distracting, and extends to the orbit, face, and side of the head: the iris is dark, assumes a dirty appearance, is irregularly contracted and fixed, the pupil often having an oblong or oval figure, in the transverse direction. A greenish discolouration is observed deep in the eye, from lost transparency of the vitreous humour. The posterior tissues swell and push the lens forwards, wedging it into the dilated pupil, and squeezing it even against the cornea. The lens also turns green, yellowish green (*Glaucomatous Cataract*), or dull white. The congestion and swelling of the internal coats distend the sclerotica, or bulge it out in parts; the cornea becomes hazy; and the changes in the iris, pupil, and external tissues, impart to the organ a dead appearance. Luminous flashes are frequently perceived in the eye; but sight is either much impaired or altogether lost—sometimes suddenly—from the commencement. At this stage the symptoms frequently subside, the iris preserving its dull hue, the pupil being fixed and dilated, and sight totally lost. A varicose state of the vessels in the sclerotica sometimes remains; or a dull leaden appearance, with small projections or larger bulgings around the cornea, as in *choroiditis* (§ 144.).

147. This disease generally affects both eyes, either in succession or at once. Its duration is various as well as its severity; and it often assumes a less violent form than that now described, especially when its early symptoms have been mitigated by treatment. In this case, sight is more gradually and slowly extinguished: the pain is less; and the external changes, particularly the bulgings of the sclerotica, are either less, or but slight. It is difficult to determine what tissue is primarily affected; but most probably the choroid, retina, and iris, are almost coëtaneously attacked. The early loss of sight indicates an early affection of the retina; and the equally early tension and pain show that congestion and swelling of the choroid is present from the first.

148. *b. The Prognosis* is extremely unfavourable. If the characteristic symptoms of this affection be present, and more especially if vision be lost, permanent extinction of sight will be the consequence.

149. *c. Treatment* has hitherto been found to have little influence on this disease. Nevertheless, bloodletting; warm purgatives, with full doses of colchicum and alkaline carbonates; revulants to the lower extremities, or behind the ears, or to the nape of the neck; active doses of turpentine both by the mouth and in enemata, so as to act efficiently upon the bowels and vascular system; subsequently PLUMMER'S pill and the decoction of guaiacum, with the compound tincture of colchicum and liquor potassæ; and full doses of sulphate of quinine, or of cinchona with or without colchicum, &c.; should be fully tried.

150. *D. Inflammation of the internal tissues after fever* sometimes occurs. It has been described by Dr. WALLACE and Dr. JACOB. Of forty cases which the former observed, there were only four who had the disease in the left eye, and only two who had it in both. It may occur very soon, or not for some months, after fever; and it presents two stages; in the first of which, aman-

EYE — PHELGMONOID INFLAMMATION OF THE BALL.

rotic symptoms are alone present; in the second those of inflammation are superadded. The period at which the former commences after fever, and its duration before redness comes on, are very uncertain. In some cases, dimness of sight and *muscæ volitantes* have been present from the earliest period of convalescence, yet the inflammatory stage has not supervened for weeks or months; and in other instances, the amaurotic symptoms have not appeared till months after the fever, and have been soon followed by the second stage. The inflammatory changes disappear before the amaurotic symptoms (WALLACE).

151. Dr. JACOB met with seventy or eighty cases of the disease in one year. It is most frequent among the poor, in young persons and in females; and attacks always only one eye. The affection of the retina having been present from a few days to several weeks, the transparent parts of the eye become more or less clouded or opaque; the circumference of the cornea presents an opaque whitish appearance or circle, resembling the arcus senilis. The anterior chamber seems clouded. The iris is always dull, and altered in colour; but tubercles of lymph or abscesses are not seen in it; and it often moves actively. The pupil is slightly irregular; yet it does not contract adhesions, or become closed. Hypopyon sometimes ensues. In the worst cases, the lens becomes partially opaque, and presents an opaline amber colour. When vision is permanently lost, it is generally owing to this change. Impairment or loss of vision is the earliest symptom; and there generally are intolerance of light, lachrymation, and a stinging or darting pain through the eye to the temple or nose. Sometimes the suffering is slight; but it is usually increased on exposure to strong light (JACOB).

152. The Treatment recommended by these two experienced writers is diametrically opposite. Dr. WALLACE found depletion and mercury insufficient for a cure; he therefore gave half a drachm, or a drachm, of bark in powder, three or four times a day; or the sulphate of quinine in two grain doses. Dr. REID also employed bark with success in this sequela of fever. Dr. JACOB, however, states, that bleeding locally or generally, purgatives and antimonials, blisters and opiate stupes, and mercurials with opium and belladonna, are the most efficacious means of cure. He adds, that the relief from mercury is so certain, that he has trusted to it almost exclusively, with the assistance of belladonna. He has generally found two grains of calomel, with a quarter of a grain of opium, or five grains of blue pill alone, three times a day, answer every purpose; tenderness of the gums coming on in eight or ten days. If the pain be severe, he combines hyoscyamus or belladonna with the dose taken at bedtime. He tried the sulphate of quinine in four cases for eight days; but finding no relief, he gave mercury, which effected a cure. The cases occurring after typhus fever, recorded by Mr. HEWSON, and which were similar to those described by Drs. WALLACE, REID, and JACOB, readily yielded to mercurial treatment.

IV. INFLAMMATION OF THE WHOLE EYE. SYN.
— *Ophthalmitis Idiopathica*, BEER; *Ophthalmitis Universalis*, WELLER; *Inflammation of*

the Globe, LAWRENCE; *Phlegmonoid Inflammation of the whole Ball*.

153. CHARACT.—Severe deep-seated pain; increased internal redness and tumefaction; a sense of tension, and a feeling of the organ being too large for the orbit, and about to burst from it; early loss of sight, with discoloured iris, and contracted, immoveable pupil; swelling and immobility of the globe, with partial protrusion of it and the eyelids; and severe inflammatory fever.

154. A. This severe disease has been well described by Mr. LAWRENCE. It consists of inflammation of the internal and external tissues, and is not of common occurrence. It is met with chiefly in very robust constitutions, and persons of a phlogistic diathesis and full habit of body. It is most frequent in the right eye, as is the case with ophthalmic inflammation generally. Mr. LAWRENCE states, that of 134 cases of ophthalmia commencing in one eye, 95 began in the right. General ophthalmitis is most commonly caused by severe injuries of the organ; by the explosion of gunpowder before the eye; by great heat and light striking upon it; and fragments of stone, iron, &c. propelled against it.

155. a. *Symptoms and Course*. — At the commencement, the characteristic injection of both the sclerotica and conjunctiva is evident; with a severe burning or throbbing pain, and a sense of bursting distension. The surface of the organ is stiff and dry; but copious lachrymation soon comes on, and is increased by exposure to light. The external redness increases; and the conjunctiva swells into a broad firm ring of chemosis around the cornea, which it partially overlaps. There are intolerance of light, dimness of vision, contracted pupil, impaired brilliancy of the iris, and acute sympathetic fever. This constitutes the *first stage* of the disease. — The motions of the globe and lids now become difficult and painful; and the pain more and more violent, extending to the brow, cheek, temple, and head. The previously blue or grey iris assumes a dull greenish hue; and the brown or black, a reddish tint. The eyeball swells and loses its power of motion; the cornea grows muddy, and, by degrees, opaque; but vision is generally lost before these changes supervene. The patient perceives luminous flashes or sparks in his eye, owing to disordered action in the retina; and the vascular distension of the internal tissues generally occasions a sense of bursting. The deep-seated swelling and external chemosis partially evert the inflamed eyelids, which thus resemble, especially the inferior, a red fleshy mass; and both the ball and lids are protruded, and immoveable. The *second stage* is now fully developed. — Sympathetic inflammatory fever always accompanies this severe disease. The local symptoms are preceded, or attended at their commencement by chills or rigors, followed by headach, white tongue, thirst, hot and dry skin; and accelerated, hard, and full pulse. These are increased at night, and accompanied with watchfulness, and throbbing in the temple and eye.

156. b. *The Consequences*, or the *second stage*, according to WELLER, are suppuration and opacity of the cornea, &c. If the disease be not arrested, the pain becomes throbbing; delirium sometimes occurs at night; and chills or rigors

are felt, indicating impending suppuration. The cornea is first a dull white, and then yellow, and matter is formed. The throbbing and bursting pain continues, notwithstanding, for some days, until the cornea bursts externally, and gives exit to the matter; the coats of the eye collapsing, and the form of the organ being lost. When the progress of the disease has been checked by treatment, the cornea remains opaque, and the pupil is either closed or very much contracted, and the aperture filled by adventitious membrane; vision being either much impaired or entirely lost. Even when recovery takes place, with an open pupil and clear cornea, the retina has generally suffered so much as to cause some imperfection of vision (LAWRENCE).

157. *c. Diagnosis.* — This complaint is characterised by the simultaneous affection of both the internal and external tunics; and is distinguished from the *sympathetic* or *specific* inflammation above considered, by the following circumstances: — (a) Redness, pain, swelling, intolerance of light, lachrymal discharge, and impaired vision, are all equally and co-ordinately developed; but in the specific inflammations, one or other of these is always predominant over the rest, and accompanied by some peculiar local and constitutional affection. — (b) These symptoms commence at the same time in an equal degree, and continue very nearly so throughout; but in the other ophthalmiae, this correspondence is remarked neither at their commencement, nor during their progress. — (c) The course of the malady is regular and continued, and it always terminates in suppuration of the globe, if not arrested by treatment; whilst the others remit more or less, and only occasionally terminate in this manner. — (d) Phlegmonoid ophthalmitis is always attended by severe sympathetic fever; but the specific forms are generally without fever, even when most severe.

158. *d. Treatment.* — It is only in the first stage that we can expect to preserve the sight. In the second stage, this will rarely be accomplished. When vision is altogether lost in this period, the preservation of the form of the organ can only be hoped for. If symptoms of suppuration have appeared, the eye will be destroyed. In the first and second stages the most active antiphlogistic measures, as directed in internal ophthalmia (§ 143.), must be practised: general bloodletting, cupping, leeches applied around the eye, and scarification of the protruded lids; with active cathartics; calomel and James's powder in full and repeated doses; turpentine given by the mouth, and in enemata with castor oil; and belladonna; constitute the chief remedies. If suppuration have occurred, the anterior chamber being full of matter, the evacuation of it by a free opening into the cornea, will give relief, and not increase the inevitable mischief.

159. *B. General Ophthalmitis consequent upon the absorption of purulent or morbid matters into the circulation,* may occur. It has been noticed chiefly after phlebitis, by Mr. ARNOTT and Mr. HIGGENBOTTAM; and is most frequent in the puerperal state, as a consequence of uterine phlebitis. The local symptoms in the early stages are the same as in the idiopathic, but less violent, and more insidious and rapid, and always terminating in suppuration and sloughing of the cornea.

The constitutional symptoms are very different, and are of a typhoid and adynamic type. All the cases that have hitherto been recorded, have terminated fatally.

160. *C. An Intermittent form of Ophthalmia* has been described by some writers, particularly HOFFMANN, CURRY (*Trans. of Med. and Chir. Soc.* vol. iii. p. 348.), and HEUTEN (*Lancet*, No. 331. p. 473.); but I agree with Mr. LAWRENCE, in considering a truly intermitting form of inflammation of any of the tissues of this organ as not to have been made out. Exacerbations, relapses, or returns, of the disease, from persistence or recurrence of the causes, may have been mistaken for an intermittent form. Frequently recurring attacks of inflammation in some one or more of the tissues of the eye, especially of the conjunctiva, and in slight and chronic forms, are sometimes caused by the sympathetic irritation of inflamed or carious teeth. — Of this form of disease, which is not noticed by writers, I have seen two or three instances; the removal of the adjoining irritation curing that depending upon it.

161. I should now have proceeded to consider the *consecutive and malignant alterations of the tissues of the eye*; but these, in a practical point of view, fall mostly within the province of the surgeon, a strictly medical treatment having but little influence in removing them. The malignant diseases of this organ are the same as those observed in other viscera, and are considered under distinct and appropriate heads. The functional disorders are treated of in the articles AMATROUS, PALSY, and SIGHT.

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FAINTING. SYN. — *Ἀσπὸψυχία*, Hippocrates. *Ἀσπὸψυχία*, Galen. Syncope (from *συνκωπῶν*, concido); *Deliquium Animi*; *Defectio Ani-mæ*, Celsus. *Defaillance*, Fr. *Die Ohnmacht*, Germ. *Swooning*.

CLASSIF. — 2. Class, 2. Order (Cullen).

4. Class, 4. Order (M. Good). I. CLASS, III. ORDER (Author).

1. DEFIN. — *Temporary depression of the ani-mal and vital actions, with pallor, cold perspiration, remarkably weak pulse, or absence of pulse at the wrist; respiration and sensation also being nearly abolished for a short time.*

2. The terms used by HIPPOCRATES and GA-LEN are synonymous with Syncope, a word of modern use. *Leipothymia* has been considered by later writers, particularly MORGAGNI, Dr. Good,

and Dr. Aën, either as the same as syncope, or as signifying a lesser grade of this affection. The definition which SAUVAGES has given, of *leipothymia*, assigns it a specific difference from syncope, or the usual form of swooning or fainting. He states it to be — “*Subitanea et brevis virium dejectio, superstite pulsûs vigore, et cognoscendi facultate.*” I have had several opportunities of observing attentively the whole progress of this affection; and I admit the accuracy of this definition, with the exception of the continuance of consciousness, which is generally somewhat impaired, although not altogether lost. The pulse is unaltered from the state in which it was before or after the seizure, or not materially influenced; and in some cases I have found it so strong as to prescribe depletion; but the respiratory actions are nearly abolished. *Leipothymia* is, therefore, an affection of the animal and respiratory functions, that of the heart not being impaired. The slight or imperfect seizures often observed to precede fully developed *epilepsy*, or to occur between, or usher in, the severe attacks, and described in that article (§ 41. 52.), are examples of the *leipothymia* of SAUVAGES.

3. *Fainting* and *Swooning* are grades of the same affection, the latter being a more complete and prolonged state of the former. *Fainting* may occur after very short or irregular periods — the *Syncope recurrens* of GOOD. It is then often followed by palpitations of the heart. — *Swooning* is much less prone to recur, but is sometimes followed by severe reaction. SAUVAGES has divided syncope into as many varieties as there are principal causes inducing it. — Dr. GOOD has adopted a somewhat similar division. As, however, it varies chiefly in degree, from whatever cause it proceeds, no further distinction, than that which I have just made, need be assigned to it.

4. I. DESCRIPTION, &c. — *Fainting* is commonly preceded by languor, a sense of sinking at the epigastrium, anxiety, confusion of intellects, obscuration of vision, cold partial sweats, giddiness and ringing in the ears, pallid countenance and quivering of the lips, and coldness of the extremities. These may continue for some time, constituting what is usually called faintness, and disappear; or they pass into full fainting or swooning more or less rapidly. It is seldom that fainting occurs without these precursors; but when it is fully developed, respiration almost ceases, and consciousness is nearly or altogether lost. The action of the heart, however, still continues, but feebly; and, although the pulse disappears from the wrist, as in full swooning, it may still be felt in the carotids; or the heart will be heard to beat on auscultation. In some instances, relaxation of the sphincters, and discharge of the excretions, are said to have occurred. But this is rare in swooning, although it sometimes supervenes in *leipothymia*, in which the brain is rather oppressed with blood, than deprived of it; and in which the pulse retains its vigour. Sickness, or even vomiting, sometimes follows faintness, or accompanies recovery from fainting.

5. The sensations ushering in syncope are generally more or less distressing to the patient, and are sometimes described as accompanied by a feeling of death. MONTAIGNE (*Essais*, liv. ii. cap. vi.) found them rather pleasurable than

otherwise; and therefore infers, that those attending upon dissolution must be similar. CHAMBERET experienced the like feelings. The duration of the seizure varies from a few seconds to one or two hours; but commonly from half a minute to ten or fifteen. It has extended in some instances to several hours. Much longer periods have been mentioned by writers; but their actual occurrence is questionable.

6. *The Consequences or Terminations* of syncope are — 1st, A return of the functions, respiration becoming more sensible and often suspirious, and eructations or vomiting occasionally supervening; — 2d, Palpitations of the heart, or general vascular reaction; — 3d, Hysterical symptoms, or a fully formed hysterical paroxysm; — 4th, Convulsions, general or partial, with or without consciousness; but they are much more frequently consequent upon *leipothymia* than upon true syncope; — 5th, Partial, or slight paralysis, or prolonged vertigo; — 6th, In cases connected with passive enlargement of the cavities of the heart, and attended by a very slow as well as a very weak pulse, coagulation of the fibrinous portion of the blood has taken place in these cavities, and after some time occasioned death; — 7th, Dissolution has occurred in extreme cases, owing either to the complete depression of cerebral and nervous power, and the consequent inaction of the heart; or to the asthenia and wasting of the parietes of this organ, in conjunction with nervous depression. The fifth and sixth of these are rare instances, however, of the latter, are adduced in the article HEART. The termination in dissolution is not so rare; and is chiefly observed in cases of great debility or exhaustion from extreme or protracted pain, or from parturition, and particularly when a sitting or erect posture has been suddenly assumed or too long retained in adynamic fevers, and after exhausting discharges or depletions. Some years since I saw swooning caused by strangulated femoral hernia, that passed into complete tetanus of many hours duration.

7. II. CAUSES. — The causes of syncope are strictly occasional. I shall consider them with reference to their operation. — a. *The causes that act more immediately on the nervous system*, are chiefly various impressions made upon the organs of sense, and depressing moral emotions. The odour of various flowers, according to the idiosyncrasy, sometimes occasions it. FABRICIUS HILDANUS has seen it produced by the smell of vinegar; and MARCELLUS DONATUS, by sweet music. The airs of their native land have induced it in persons subject to nostalgia. Various unpleasant sights, or objects of aversion, have caused it — as the sight of blood, of surgical operations or of a corpse; also sudden terror, fear, anxiety, disappointment. The impression made by mephitic or infectious emanations upon the nerves of smell, frequently induce more or less of faintness. Concussions and injuries of the brain; blows upon the epigastrium; shocks of the whole frangulation; rotatory motions, and swinging; excessive or prolonged pain; pleasurable sensations carried to excess, particularly the sexual organs; the exhaustion consequent upon inordinate excitement, long fasting, and the abstraction of accustomed stimuli; likewise operate principally in this way.

and excessively indulged, are remarkably liable to faint from the slightest mental or corporeal cause; and there is reason to believe that the liability is increased by repetition or the habit of fainting.

13. *Pathological Inferences.* — 1. In syncope, the heart's action never, perhaps, entirely ceases until it terminates in death. — 2. In fainting from hæmorrhage, cerebral influence, especially the voluntary powers and volition, is abolished before the heart's action is reduced to its lowest state; but, unless the swoon be complete, sensibility and consciousness are not entirely suspended. — 3. The like obtains in fainting from moral emotions and impressions made upon the senses; cerebral influence is first diminished, and instantly afterwards the action of the heart is weakened, the weakened vascular action still further impairing cerebral power, until fainting is the result. — 4. Several causes, both external and internal, or pathological, particularly those already specified (§ 9.), seem to act coëtaneously and co-ordinately upon the brain and heart, through the medium of the organic system of nerves; whilst others of the same class of causes (§ 9.) seem to influence more immediately and especially the heart through the same channel. — 5. Certain causes may suddenly derive the circulating fluid to the external surface or other parts; and the sudden diminution of the quantity returned to the heart and propelled to the brain, may induce faintness or full syncope. — 6. The sudden reflux of blood to the right side of the heart, especially when it supervenes rapidly upon the states just specified, may occasion fainting, by overpowering the heart's action, and thereby diminishing the supply of blood to the brain. — 7. Fainting may arise from inflammation of the heart, or effusion into the pericardium. — 8. It may also occur from the imperfect action of the heart caused by deficient organic nervous power, particularly of the cardiac nerves, with or without dilatation of the cavities, and weakness or softness of the parietes of the organ. — 9. It may be occasioned by circumstances preventing the return of blood to the heart. — To either of these two last are to be imputed the fatal cases of syncope related by Mr. CHEVALIER and Mr. WORTHINGTON, in which the cavities of the heart were found empty and relaxed, and the large veins adjoining devoid of blood.

14. Indeed, *death* may supervene in any of the modes in which syncope is produced, especially when carried to the extreme. Thus I have seen, in two instances, a moderate dose of the acetate of morphia occasion loss of voluntary motion, and scarcely perceptible pulse and respiration — the characteristic phenomena of swooning. A larger quantity might have caused death; its operation — extended from the stomach to the heart and brain — being the same, but so great as to put an end to the functions of these parts. Other causes, inducing any one of the pathological states now assigned, may act, in favourable circumstances, and in highly predisposed persons, so energetically, as to terminate altogether the vital actions; predisposition or pre-existent states of the frame, such as have been mentioned, being often as influential in producing the result, as the more direct cause.

15. III. *DIAGNOSIS.* — Syncope may be con-

founded with *apoplexy*, with the seizures to which the term *leipothymia* is strictly applicable, with *asphyry*, with certain states of *hysteria*, and with *death*. — (a) The strong, laboured, or stertorous breathing, and the full strong pulse; sufficiently distinguish *apoplexy* (see that article, § 66.) from fainting. — b. In *leipothymia*, volition and voluntary motion are abolished, and consciousness nearly or altogether: but the pulse either is not affected, or is even fuller than usual; and it is more frequently the first stage of, or followed by, epileptic and apoplectic seizures, than true syncope. Frequently, also, *leipothymia* is intimately associated with epilepsy, the former being either the earlier manifestations or the lower grade of the latter. — c. In *asphyry*, the actions and functions of respiration are the first to cease: the circulation of venous blood continuing for some time, until, owing to the privation of pure atmospheric air, the passage of blood through the lungs becomes obstructed, as first shown by Dr. WILLIAMS (*Edin. Med. and Surg. Journ.* Oct. 1823.), when total arrest of the pulmonary circulation, abolition of the cerebral and nervous functions, and lastly, cessation of the heart's action (see *ASPHYRY*, § 14 *et seq.*), are the consequences. Respiration and circulation are here quite at an end; and the countenance and general surface are reddish, livid, tumid, or bloated, whereas in *syncope* the face and surface are pale and collapsed, and the respiratory functions and circulation still continue, although in a low and occasionally almost imperceptible state. In the former, there is remarkable congestion of the lungs and head: in the latter, the brain is generally insufficiently supplied with blood; and the circulation of the lungs, although languid, is seldom obstructed, and never altogether arrested, unless a termination in death supervenes. — d. Various manifestations of *hysteria* either very closely resemble fainting, or are in some way or other associated with it. The more remarkable phenomena of *hysteria* may follow, or precede fainting, most frequently the former; but the loss of motion and sensation often partakes more of the characters of *leipothymia*, than of swooning, the pulse at the wrist being but little affected. Pain under the left breast, *borborygmi*, and a sense of suffocation, which commonly precede the hysterical form of syncope, sufficiently mark its nature: and even when these are not present, other signs soon manifest themselves, especially convulsions, weeping, laughing, &c. (See *HYSTERIA*.) — e. Syncope is rarely so profound as to be mistaken for death; but PORTAL and CHAMBERLAIN, with some writers on medical jurisprudence, concur in thinking that it may be both so complete and prolonged as to endanger premature interment in countries where the last rite is early performed. Whether or not the action of the heart, which cannot be altogether abolished even in such cases, may be detected by the stethoscope, I am unable to state; but it surely cannot continue many minutes without detection upon a strict scrutiny, unless death have taken place. The state of the cornea, which is soon covered with a film, or deprived of its delicate transparency, and afterwards collapsed; the appearance of the thorax upon examination; the sound yielded by auscultation; the condition of the body in respect of flexibility, &c.; and the

23. *B.* The removal of the causes of the affection, when these are of a constitutional or structural kind, must be attempted after recovery from the seizure. If it depend upon DEBILITY, the means advised in that article will be requisite; and in other circumstances, the treatment suitable to inferred pathological conditions should be practised, as pointed out in the places where such conditions are more especially and appropriately considered. — The prevention of a return of the affection will be most effectually secured by this procedure.

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FAUCES. See THROAT — *Diseases of the.*

FAVUS AND ACHOR. See PORRIGO and PUSTULES.

FEIGNING DISEASE. — CLASSIF. — DIAGNOSIS. — SYMPTOMATOLOGY.

1. Disease may be — 1st, *Pretended or simulated*, the person being in a state of health; — 2dly, *Artificially excited*, disorder being actually produced; — 3dly, *Exaggerated* in the description and appearance given of it, the patient being indisposed; — and, 4thly, *Artificially and intentionally increased*, or aggravated during its course. In these four modes, disease may be said to be feigned or simulated.

2. The objects desired to be accomplished by those who undergo the inconvenience, suffering, and moral degradation of feigning disease, are — *a.* To escape from being levied into the public services; — *b.* To procure a discharge from the public service; — *c.* To obtain both a pension and a discharge; — *d.* To enjoy the ease and comfort bestowed on the sick, and to escape from hard work, or unpleasant employment, mental or corporeal; — *e.* To obtain objects of desire, or to procure compliance with wishes or caprices; — *f.* To avoid punishment; — *g.* To excite compassion or interest; — *h.* To deceive.

3. The persons who feign disease with one or more of these intentions are — *a.* Soldiers and sailors; the former being usually called *malingersers*, the latter *skulkers*; — *β.* Slaves and serfs; — *γ.* The lowest class of labourers, and mendi-

cants; — *δ.* Members of benefit societies; — *ε.* Persons who have received accidental or intended injury, and desire to obtain increased compensation for it; — *ζ.* Prisoners for debt, or for civil or criminal offences; — *η.* Young persons of both sexes wishing to escape from the confinement of school and the labour of study, or longing for a return to their homes; — *θ.* The spoiled or indulged, who desire to excite interest, or to obtain a compliance with their desires; — *ι.* and lastly, Those who wish to accomplish objects of private or political ambition, or to gain particular ends. — Feigning disease has been resorted to with the last-mentioned view, very probably from the earliest times. AMNON the son of DAVID, ULYSSES, SOLON, the elder BRUTUS, the Roman CÆLICS ("Desit fingere Cælius podagram." — MARTIAL.), "HOTSPUR's father, old NORTHUMBERLAND," the Constable BOURBON, POPE JULIUS III., the Earl of ESSEX, and RALEIGH, grace this class of *malingersers*.

4. Disease may be so artfully feigned in one or other of the modes just stated (§ 1.), as to require the utmost discrimination and ingenuity to detect the imposture. It is obvious, as Dr. CHEYNE remarks, that the discovery of it will be most readily made by those who are the best physiologists and pathologists, and most accurately informed respecting the operation of medicinal agents. In doubtful cases, the practitioner should take into consideration the constitution, education, information, habits, and probable motives of the person; and examine more especially those symptoms which are counterfeited with the greatest difficulty, in respect not merely of their individual, but of their correlative, characters. The frequency and rhythm of the pulse, in connection with the temperature, colour, and humidity of the skin; the expression of the eye and face; and the fœtor, colour, and consistence of the excretions; should especially arrest attention. A morbid appearance may be communicated to the excretions, and to the tongue and mouth; but a morbid fœtor of the former, and various states of the latter, are counterfeited with great difficulty. The intelligent observer will infer much also from the manner of the simulator; from the consistency of the account given by him; and from the relation one symptom bears to another, in its seat, nature, or severity; and will be careful not to lead him to suspect that the reality of his ailments is for a moment doubted, until proofs of detection are complete. The circumstance of impostors always overacting their part, overloading their accounts with unnecessary details, complaining of their sufferings, and readily falling into the snare of enumerating incompatible symptoms, when a leading question respecting them is put, should not be overlooked. They are seldom desirous of obtaining medical aid, or of submitting to the treatment directed, and, in every case, strict attention should be paid to the exhibition of the medicines ordered, which ought never to be left in the possession of a suspected person. In doubtful, and even in real, cases of feigning, painful or even severe measures should not be inflicted, as in most instances, and especially in the public services, the mind of the impostor is made up to endure even torture rather than give in.

5. The importance of this subject in private

in the *Cyclopædia of Practical Medicine* mentions a remarkable instance of deception practised by a young woman at Edinburgh, and continued from 1817 to 1830. She feigned during that time, hepatitis, epilepsy, amaurosis, aphonia, deafness, paralysis, gravel, anasarca, hæmatemesis, convulsions, gastralgia, dyspnoea, retention of urine, vomiting of substances resembling liver, bone, &c., and at last concluded by excreting bone from the vagina. Bone was first detected in the vagina in 1824, whilst introducing the catheter, and large quantities were passed, or extracted, — some even from the bladder. She was received into the hospital in 1825, and the bones which she passed were believed for a time to be those of an extra-uterine foetus. She was there detected by cutting off the supply, and discharged. She afterwards had recourse to the same practice, but at last varied it, and had an illegitimate child in 1828.

14. **DEAFNESS** and **DEAF-DUMBNESS** are simulated by those who wish to escape from the army or navy, or from criminal trials, and by mendicants. They generally lose their hearing suddenly; whereas real deafness is gradual, or the consequence of severe illness. The expression of the countenance and a change in the pulse often betray the impostor when something of great importance is said in his hearing. But some are prepared for this, and are even unmoved by very sudden noises. Mr. DUNLAP states, that a soldier feigned deafness so well, that firing a pistol at his ear produced no effect; but on the experiment being tried after he had been put to sleep by opium, he started out of bed. Those who feign *dumbness*, are generally unaware that if a person has acquired the use of speech, he never can become dumb, however deaf he may be. The really dumb acquire an expression of countenance and gestures which are assumed with great difficulty, and few have sufficient art and perseverance to counterfeit deafness and dumbness, so as to avoid detection for any length of time. Some have attempted even to cause deafness, by introducing solid bodies into the ear, or by exciting inflammation of it by irritating matters. Honey and various other substances have been employed so as to simulate *otorrhœa*. The organ and the discharge from it should therefore be carefully examined.

15. **DELIVERY** has been pretended, with an obvious intention, after artificial abdominal enlargement and sudden subsidence of the tumefaction. In this case the external parts of generation are moistened by procured blood, and the child of another substituted as the female's own. This cheat can be detected only by examining *per vaginam*. Soon after real delivery, the vagina will be relaxed as well as the os uteri; the latter tumified and tender, and the lochial discharge flowing. But these signs will become less evident, the longer the time that has elapsed; and, after nine or ten days from parturition, they cannot be depended upon; but the well-known state of the integuments of the abdomen, and the appearance of the mammæ, will aid detection.

16. **DROPSY** has been simulated by French conscripts, who have been said to have actually injected water into the cavity of the peritoneum, and thereby produced factitious ascites. — Anasarca of the extremities has been caused by

ligatures artfully concealed; but the imposture will be detected upon strict examination of the naked body, and by the absence of a leucophlegmatic or cachectic appearance. Cushions fitted to the abdomen, and padded clothes, are the modes resorted to by mendicants; but these require no remark. Instances are mentioned by MANGETUS, SAUVAGES, and others, of *chronic dropsy of the head* being simulated by mendicants, who have daily blown air under the scalp of children through a small perforation at the vertex, until the scalp became enormously distended.

17. **DYSENTERY** and **CHRONIC DIARRHŒA** are often feigned by soldiers and sailors, particularly in warm climates; and are sometimes actually produced by their using irritating substances for the purpose. Mr. COPLAND HUTCHISON has seen even a fatal result follow such practices. He ascertained that vinegar and burnt cork were often used to cause the disease. Suppositories of soap, and irritating substances introduced into the rectum, have also been employed to cause mucous discharges (*CHŒYNE*); but drastic purgatives are more frequently taken in sufficient quantity for this purpose. The dysenteric evacuation is simulated by breaking down the fecal evacuation in the urine, and mixing with it the blood procured by pricking the gums. The imposture is detected by the cleanness of the linen; by obliging the patient to use a night-chair, and by watching his proceedings.

18. **EMACIATION** — partial or general. *General emaciation and debility* are sometimes occasioned with the view of avoiding some disagreeable service, or to be sent home from foreign service, or to procure change of climate. Abstinence from food and sleep, the frequent use of purgatives or diaphoretics, especially antimony, and excess in spirituous liquors, are the means commonly resorted to. Wasting of a limb is caused chiefly by mendicants, by means of continued compression; and the diagnosis between artificial and real wasting is often very difficult. Detection must depend upon a strict examination, and a variety of considerations thereby furnished to the duly qualified examiner.

19. **EPILEPSY** is very frequently feigned by mendicants, by sailors and soldiers, and occasionally by females to serve particular ends. In such cases it is proper to notice whether the person falls to the ground without regard to the situation or place; whether the face be livid, the pupil fixed, the spasm and convulsions general, the pulse altered, the insensibility complete, the mouth distorted and frothy; and whether sopor follow the fit, passing into heaviness, vertigo, and exhaustion, as all or most of these symptoms are absent, or imperfectly evinced in the simulated disease. The opportune appearance of, and selected situation for, the feigned paroxysm, the partial or successive production of the muscular actions, the sensibility of the iris, the abrupt termination of the seizure, and the absence of injury to the tongue, should also be taken into account. Foaming at the mouth is sometimes imitated by means of soap kept in it; but it is generally overdone in this case. The real epileptic is desirous of concealing his infirmity; whilst the simulator talks of his disease, and never endeavours to avoid publicity. It is chiefly, however, by artifice that feigned epilepsy can be fully

been found so firmly bound around the neck, as to cause a livid and swollen countenance, and disorder the heart's action. Dr. QUARRIER and Mr. COPLAND HUTCHISON ascertained, that white hellebore was often used by sailors to produce this effect; vomiting, purging, syncope, tremors, and nervousness, followed by palpitations, being the usual consequences of a large dose of this substance. Mr. DUNLOR states, that death was occasioned in one instance by the use of hellebore with this intention.

27. HEPATIC DISORDERS are often feigned by soldiers in warm countries, particularly in India; and by officers and others desirous of returning to Europe. If any doubt of the reality of the complaint exist, the person should be undressed, and carefully examined by percussion and the stethoscope. The absence of enlargement in the region of the liver, the complexion, and appearance of the surface and limbs, and the state of the pulse and respiration, are the circumstances which should chiefly be considered. It ought not, however, to be overlooked, that most serious disease of the liver may exist without enlargement; and this viscus may be considerably enlarged, and even rise up into the right thorax, without being felt below the ribs. Hence the propriety of having recourse to percussion and auscultation in the investigation, especially when other proofs of disease are wanting.

28. HERNIA and HYDROCELE have been simulated by blowing air into the cellular membrane of the scrotum. Mr. C. HUTCHISON met with an instance of hernia being feigned, by elevating the testes to the external abdominal rings. Detection in cases of this kind is quite easy.

29. HYSTERIA is not infrequently feigned. Dr. DUNGLISON directs sternutatories to be employed; but the affection may be real, although they produce their usual effect. Detection is by no means easy, especially when an intelligent female simulates this complaint. In a case to which I was lately called, the moral circumstances and the symptoms induced me to infer deception; and I accordingly took my leave, by simply stating, in the patient's hearing, that, if recovery was not complete in a few minutes, the affusion of cold spring water over the head and neck would certainly have the desired effect. It should, however, be recollected, that females who are really hysterical are the most prone to feign disease; this affection and the desire to simulate others frequently arising from the same cause, viz. uterine irritation.

30. JAUNDICE, notwithstanding the difficulty of the attempt, has been successfully simulated, particularly in France, during the late war. Conscripts employed an infusion of turmeric to tinge the skin, muriatic acid to give the evacuations a clay-colour, and rhubarb to heighten the colour of the urine. But the white of the eye cannot be changed by art, although smoke has been tried for this purpose. Washing the surface and preventing access to the materials of deception are the chief means of detection.

31. INSANITY in some one of its various forms—but most frequently mania, melancholy, and idiocy—is frequently feigned; and detection is by no means easy. There can be no doubt that, in the public services, pretenders often gained their ends; and that the really afflicted were some-

times treated as impostors. Nor can this be a matter of surprise, when the great difficulty of discrimination is considered. In the present day, madness is most commonly feigned with the view of escaping from the punishment due to crime; and the responsibility of the medical examiner is consequently great. He should, therefore, have every facility afforded him, and take sufficient time to the investigation, that he may arrive at a correct conclusion. He should endeavour to obtain from the individual a full account of himself; mark its consistency, and place an intelligent watch over him. The expression of the countenance, and of the eye; the gestures and manner; the state of the tongue, the appetite, and the evacuations; and especially the duration, continuance, or frequency of sleep; ought to be carefully observed. Certain expressions of countenance and gestures are so peculiar to the insane, that the experienced observer will infer much from them. Pretenders generally overact their parts; assume the more violent or disgusting forms of mania; do not maintain the deception when they believe themselves unobserved; recommence it in the society of others; and possess not the power of prolonged abstinence from sleep and food so generally observed in the truly insane. Sound sleep soon overpowers the pretender, whereas the insane are remarkably watchful; sleeplessness to a distressing degree often preceding the disease, and always attending it throughout, for much longer periods than can ever be endured by a person in health.

32. The insane, during remissions, are desirous of being considered free from the malady, and often assiduously endeavour to conceal whatever may betray them; but simulators seldom carry their deception thus far. The real malady usually commences with slight disorder of the common modes of thinking and acting; and advances slowly through some hallucination, until at last it is either fully developed, or is suddenly exasperated. The feigned disease, on the contrary, presents not this course; is not preceded by sleepless or restless nights, and by a continued consideration of one topic; but appears at first at its full violence. The existence or non-existence of the causes of insanity, of previous attacks, of pre-existing eccentricity of manner or thought, of hereditary tendency, of antecedent affections of the brain, of injuries of the head, &c., the character of the individual, and the motives for feigning, will also be considered by the physician. Care should be taken not to infer deception, because the motives for it are apparently strong; for the circumstances constituting the motives may be the causes of the real malady. The constive state of the bowels; the large doses of medicine necessary to move them; the comparative insensibility of the stomach to tartarized antimony; the generally more frequent pulse, and the sudden and extreme irritation on any contradiction, observable in the manically insane; should not be overlooked, as they hardly admit of being feigned. Their disregard of the decencies, comforts, and affections of life, ought also to be taken into account; for, although these signs are often also simulated, deception in respect of them is seldom carried so far as in the real malady. A person even of pure character, when truly insane, will often use the grossest

ease of the kidney was not suspected by the numerous eminent men whom he consulted; but this organ was, nevertheless, found after death, filled with calculi. I have met with two or three instances of the most severe pain, recurring at irregular intervals, in a particular joint — in the left shoulder joint in one case, and in the right knee in another — without any apparent local or constitutional disturbance; the tongue being clean, the bowels regular, the appetite good, and the flesh and strength undiminished. An ointment, with a large proportion of veratria, was employed for some time in one of these cases, without benefit. The most successful means, in both, were such as improved the digestive and excreting functions. These cases, in circumstances admitting of the least suspicion, might have been considered as feigned.

37. I have no doubt that formerly, when the pathology of the spinal chord and its membranes was less attended to than now, many very severe affections, occasioned by changes in this quarter, were viewed as fictitious. — I lately attended an intelligent tradesman, advanced in life, who long complained of severe pains in the thorax, darting through both sides, and often backwards to between the shoulders. They were occasionally most violent, and fixed themselves for a time in one place, and then in another, of this cavity. The functions of circulation and excretion were unaffected, but the respiratory actions were sometimes disturbed. One day he was unable to get out of bed; and another he came down to his parlour. His complaints were considered chronic pleurisy, adhesions of the pleura, rheumatism of the thoracic muscles, &c. When first called to him, I examined the thorax by auscultation and percussion. The sounds furnished by both were perfectly healthy. The liver was thought to rise rather high; and the stools were deficient in bile. Chronic disease of the liver was, therefore, suspected. Upon extending the examination to the spine, two of the spinous processes of the upper dorsal vertebræ were found very prominent, and pressure in this situation caused great pain. The treatment was directed accordingly, and amendment took place. These cases evince the importance of a very minute and extended examination, in ascertaining the cause of pain, and, consequently, of proving its reality. When severe pain is complained of by females in any external or internal part, an opinion as to its reality or nature should not be given until the spine is carefully examined, and the state of the uterine functions inquired into. The existence or non-existence of tenderness, pain, or fulness in the hypogastric, iliac, and sacral regions, indicating disease of the uterus or ovaria, ought also to be ascertained; for if the least sign of disorder in any of these situations be detected, we ought not to infer deception, although it must be admitted that exaggeration, and even deception, may be practised nevertheless.

38. OPTHALMIA was not infrequently produced by soldiers and conscripts during the last war, by means of corrosive sublimate, powdered alum, quicklime, acids, salt, tobacco, and various acrid powders and mechanical irritants. The extreme rapidity of the inflammation, especially as respects its invasion of the conjunctiva oculi and cornea, and the circumstance of the right

eye only being affected, should excite suspicion. The chronic forms of ophthalmia were also excited and kept up by extracting the eyelashes and applying irritants to the edges of the eyelids. When entire seclusion of the suspected patient cannot be obtained, as in the navy, the recommendation of Mr. C. HUTCHISON to use the strait waistcoat should be adopted.

39. PALSY and SHAKING PALSY are not often feigned. If, with the loss of motion, or the continued agitation of a limb, or one half the body, the general health appears to be good, and the excretions natural, a watch should be set upon the patient, and his actions observed when he thinks himself unnoticed. The cold affusion, electric shocks, moxas, and the actual cautery, will often have a wonderful effect in suspicious cases. Even the threat of having recourse to these means has been sufficient. — In cases of simulated paralysis, detection may be easily accomplished by causing sleep by opium, and then tickling, irritating, or pinching the motionless extremity. If the disease be feigned, the limb will be retracted or withdrawn: and, upon first waking, it will often be used before the patient reflects himself.

40. POLYPUS of the Nose has been often excited, according to MM. PÉREY and LAURENT, by French conscripts, who have succeeded by introducing the testes of cocks, or the kidneys of hares or rabbits, into the nostrils, and retaining them there by means of sponge to which they had been fastened.

41. PREGNANCY is often pretended, to gratify the wishes of a husband or relations, to increase interest, to extort money from a paramour, to deprive a legal heir, to delay the execution of punishment, and to avoid labour. A careful examination of the areolæ, of the mammæ, of the umbilicus, and of the os uteri, will generally lead to detection, at least in the more advanced months. (See PREGNANCY.)

42. PULMONARY DISEASES are not often feigned, but I have met with instances — two in females — in which slight symptoms have been exaggerated into the appearance of dangerous disease, particularly in the description of them, in order to accomplish particular ends. In such cases, the patient has a frequent and short respiration, and a hacking cough, with little or no expectoration; complains of the pain on coughing or taking a full inspiration, and of night sweats; evidently desires to be considered very ill, but is averse from medicine: as he considers it of no use; and even resorts to various means to produce emaciation, particularly vinegar, the oxal. of copper, cream of tartar, tartaric acid, &c. The state of the pulse, the sounds produced by auscultation and percussion; the apparent despondency, instead of the continued and unwearied hopes of the patient, characterising the real disease; the marked reluctance to have recourse to issues, setons, or counter-irritants; and an enquiry into the wishes of the patient as to regimen, &c. are the chief means of detection. In private practice, the physician should endeavour to ascertain whether or no the treatment directed is strictly followed, particularly the section of issues, setons, &c.; for if these be not adopted after a confident recommendation of them, strong suspicions of deception should

of the thigh and leg, resembling elephantiasis, was sent home from India to be discharged. A ligature was discovered, and, upon its removal, the swelling gradually subsided. — The detection and prevention of such cases cannot be difficult.

49. **ULCERS** artificially caused were remarkably frequent in both navy and army, during the last war. They were generally produced upon the legs by various caustics or irritants, by friction with sand, by quicklime mixed with soap, by compression with metallic or other bodies, and by mineral acids. Arsenic, corrosive sublimate, tobacco, &c. have also been used for this purpose. Mr. C. HUTCHISON found a halfpenny between the muscles of a leg which he removed in consequence of extensive caries of the tibia following artificially formed ulcers. Intentional ulcerations are distinguished from the real, by their borders being less callous, their surfaces more superficial and less painful, and their disposition to heal, when secured against tampering, much greater, owing to their not originating in, or accompanying, constitutional disorder, as in the case of real ulcers. — In order to prevent this species of deception, Mr. C. HUTCHISON had recourse to a wooden box, in which he locked up the whole limb; all other means, as marked or sealed bandages, &c., having been found insufficient against the ingenuity of malingerers.

50. The **URINE** presents various disorders in respect of its characters and of its excretion, which have been artificially produced or feigned by persons desirous of escaping from the public services, and by hysterical females. — *Incontinence of Urine* was often simulated by sailors and soldiers. The circumstance of this disorder occurring frequently in this class of persons, who are mostly young, or in the vigour of life, should excite suspicions of its reality. The simulator generally chooses the circumstances and place suitable to his purposes in allowing the urine to escape. LAURENT and PERCY state that the *glans penis* is always pale and shrivelled in real incontinence, and that the urine never comes away in a stream. M. FODÉRÉ finding that this complaint was becoming epidemic in a regiment, and that blistering the perinæum and other means did not cure it, directed the penis of every patient to be tied, and the knot sealed, none but the person guarding them being allowed to remove the ligature. The penis was observed from time to time, to ascertain whether or no distension above the ligature existed, and whether, when it was removed in order to urinate, the discharge took place *guttatim*, as in real incontinence, or in a stream. The expedient succeeded, and the epidemic vanished. (Vol. ii. p. 481.) PERCY and LAURENT prescribed twenty lashes to the loins, with the avowed object of exciting the weakened organs. It was unnecessary to direct it to a second case. An army surgeon directed a cold plunge-bath twice a day with equal success; and Mr. HUTCHISON, Mr. COMYNS, and Dr. HENNEN caused a strong opiate to be given at night, and the length of time the urine was retained during sleep to be watched; for, in real incontinence, the urine passes away after a short time under all circumstances. The patient may also be caused to undress and stand before the medical man at the time when he states that his urine

usually passes off. In cases of feigning, the abdominal muscles will be seen contracting in order to expel it.

51. *Bloody Urine* has been simulated by the ingestion of beet-root, madder, the extract of log-wood, the fruit of the prickly pear, the India fig, &c. But blood is more frequently mixed with the urine. PERCY and LAURENT state, that conscripts have injected blood into the bladder, in order to imitate hæmaturia. This disease has even been occasioned by having recourse to cantharides. A boy in Staffordshire, in 1617, having accused a woman of bewitching him, feigned various maladies; and, amongst others, the excretion of *black urine*. The wisdom of our ancestors condemned the woman to be burnt, as was usual in such cases; but the Bishop of the diocese, suspecting imposture, caused the boy to be watched, when he was detected dipping cotton in ink, and afterwards introducing it within the prepuce, in order to give the urine which he publicly voided its dark colour. (*Mem. of Literature*, vol. iv. p. 357.)

52. The excretion of *Gravel*, and of other substances, has likewise been feigned. In all cases, as well as the foregoing, the person should be made to urinate in the presence of the physician. The real existence of gravel is ascertained beyond doubt, by close inspection and chemical analysis. — *Strictures* have also been feigned; but the passage of a bougie will always ascertain their reality in the hands of an experienced surgeon. — *Suppression and Retention of Urine* have been pretended; but most frequently by convicts, and hysterical females. The introduction of the catheter, and a strict watch will generally show the state of the case.

53. **UTERINE DISEASES** have been feigned and exaggerated, and I believe more frequently than is commonly supposed. It was attempted in a case in which I was some years ago consulted, but the object becoming apparent I withdrew. This kind of simulation is sometimes adopted for an evident motive, as dislike of a husband, &c.; in other cases the object is not so apparent. THOMSON, of Edinburgh, mentions an instance of a female in a respectable station, who pretended to pass vesicular bodies resembling hydatids from the vagina. They were ascertained to be prepared from the intestines of a pig, and were made to resemble a string of beads.

54. **VARICOSE VEINS** have been caused by ligatures or pressure made in the course of the large trunks. They may also be aggravated, when already present, in a similar way. Attentive examination, and the means advised for ulcers, &c. will generally detect the deception, and prevent it.

55. **WOUNDS** have been both pretended and inflicted intentionally. The feigning of wounds has been sometimes practised to avoid the dangers of battle, or to be mentioned in despatches. Means which may occasion the appearance of a contusion, as abradings or discolouring the surface, are chiefly resorted to. Detection will depend upon attendant circumstances and the acuteness of the surgeon. Mutilations, or intentional wounds, are more commonly resorted to in order to avoid conscription into the public services, or to obtain pensions or a discharge. They are sometimes also practised by slaves, mendicants, and revengeful persons. And would

the time of their operation. But, still the more remarkable phenomena of these separate diseases proceed in a very different order, and very generally in so marked a manner, as to be easily distinguished by the close observer. The most frequently exciting causes of disorder, viz. mental distress, atmospherical vicissitudes, exposure to cold, moisture, &c., shall, according to the state of the individual at the time, produce an attack of general disease, unaccompanied by predominant affection of any particular organ; and the disorder shall commence and terminate without any complication. In a second individual, a more or less evident determination of the malady, or even inflammation, shall appear in the advanced course of the general disease, or even during convalescence. In a third, the local disorder shall be coëtaneous, and more or less co-ordinate with the general affection, or even outstrip it in violence during its course. And in a fourth person, local disease alone shall be primarily caused; on which, as it increases, and as inflammation becomes more fully developed, symptomatic fever, or the general derangement, shall supervene. These different states of diseased action follow the same cause, according to the disposition, susceptibility, or states of the system at the time. One person, according to this proposition, may have the constitutional derangement complicated with *rheumatic*, *catharrhal*, *bilious*, *nervous*, *gastric*, or *dysenteric* affection; the general disorder being attended from some early stage of its course, or from the commencement, by a heightened disease of a particular organ, or structure, and thereby constituting varieties of fever, which have been thus denominated and described by STOLL, DE HAEN, REIL, FRANK, HILDENBRAND, and others, and have occurred in epidemic forms on various occasions. Another person may have the nervous, the gastric, or the dysenteric characters superinduced in the progress of the disease, owing to external causes continuing in, or coming into operation; or to improper treatment: and a third may experience, in consequence of the pre-existing state of a particular organ or texture, an attack of inflammation, from a similar set of causes to those which produce idiopathic fever. If, therefore, the species of disease which arise from one class of causes are thus varied, owing to the predisposition of certain organs, or to the susceptibility of the whole system, their number must necessarily be further increased, and their characters very materially changed, when the additional influences of marshy exhalations, epidemic constitutions, or specific infections and contagions, come into operation. Diseased actions become not only more varied and extended by such additional causes, acting either singly or in conjunction, but also much more complicated and violent.

4. These inferences may be legitimately deduced, from an extensive survey of some of the circumstances connected with acute diseases. Their relation with such derangements as have obtained the appellation febrile, is still more intimate than with those which, strictly local at their commencement, induce consecutively general disorder. It is necessary, however, to the proper consideration of the pathology of fever, that due regard be paid to the nature and extent of its causes, and of modifying or determining in-

fluences, as far as they can be ascertained; and that a strict reference be had to the effects observed to follow the application of both classes of agents, under opposite or varying circumstances. It will also be requisite, while such an inquiry is being prosecuted, that none of the early and intermediate changes be omitted. Such omissions have but too often vitiated our speculations on the nature of disease, and more especially of fever, for, instead of recognising the early changes and states, particularly those which more directly arise from external agents, consecutive and gross effects only have more generally been seized upon, and assigned as the cause of disease. Let it not be supposed that inquiries, such as have just been recommended, are productive of no advantage in practice. The scientific practitioner will consider the most effectual means of preventing, controlling, or removing disordered actions, to be indicated by a most careful scrutiny into their nature and extent, and by a judicious inquiry into early aberrations from the healthy condition. He will view the primary derangements, in the relation they hold with their remote or occasional causes, on the one hand, and with consecutive or ultimate lesions on the other; and will trace each individual link of the chain of causation throughout.

5. If it be asked, What has the treatment of fever gained by our speculations as to its nature? I would answer, almost every thing. I will show this in a more demonstrative manner in the sequel, by adducing the opinions which have formerly been held upon the subject, with the practice to which they have led. But, independently of the practical results of the inquiry, there are other solid and not less alluring inducements which will operate on the inquisitive and well-tutored mind. An individual possessing a mind so constituted, feels a laudable zeal in examining into the nature of a class of disorders, which concerns not only the existence of a single individual, but influences also the prosperity of nations; and who, entertaining even a moderate idea of the responsibility which the exercise of his profession involves, can enter upon its practical discharge in respect of this class of diseases especially, without feeling some desire of extending his knowledge of their nature, in order that the course he pursues may be both rational and successful?

6. I. GENERAL VIEW OF FEVER. — Fevers are the most prevalent of all diseases, especially in some countries and localities; and their causes frequently cannot be avoided nor counteracted by human foresight or science. They are more especially prevalent among, and injurious to, the human species, as the history of epidemic, pestilential, and other fevers fully prove; and as evinced by those infectious fevers which often occur in camps, and follow the rears of armies during warfare, and which are sometimes much more destructive than the most hard-fought battles. — Epidemic fevers are not, however, confined to the human species; the causes in which they originate, and the influence which promote their extension, frequently affecting also the lower animals, — a circumstance of importance in our speculations respecting the origin and nature of this very important class of maladies.

7. I. CHARACTERS OF FEVER. — It is impossible

attended by congestion of the vessels of the head. It is observed in other diseases; but it most constantly accompanies fever. — *g.* The appetites also are more or less affected. The appetite for food is diminished or entirely abolished. In rare cases, a craving for food has been observed in an advanced stage of fever, but not throughout its whole course. The appetite for the sex is also abolished until convalescence has commenced, when it reappears, and is sometimes one of the earliest signs of amendment. These symptoms probably depend upon the same cause—upon depressed organic nervous influence, and consequent deficiency of the secretions.

14. ii. GENERAL DESCRIPTION. — The word *Fever* is used in a double sense: it is applied — 1st, to that state of constitutional disturbance, in which the above symptoms are primary, essential, or idiopathic; and, 2dly, to the general disorder consequent upon, or symptomatic of, some local disease. In the latter, the febrile symptoms consist chiefly of increased heat and accelerated circulation; and without these the patient is said to be without fever. But when fever occurs primarily—is a disease *sui generis*—these two symptoms are seldom the most prominent, and are always associated with others, especially those already noticed, which may be much more manifest than they, and which are either altogether wanting in symptomatic fever, or not similarly associated, or only occasionally present. This distinction is necessary, particularly as respects the treatment, and should never be overlooked. Its importance will be more apparent in the sequel. I shall first describe fever as a disease *sui generis*; and next, as a symptom of inflammation, or some other disease of a particular organ or tissue.

15. IDIOPATHIC FEVER presents, during its whole progress, characteristic symptoms, not consisting merely of increased frequency of circulation and augmented heat, which are sometimes wanting in certain stages of the disease, but of other morbid phenomena that are equally important, that vary in degree and in modes of association with one another, and that superinduce other phenomena thereby giving rise to the different forms and states in which the disease occurs;—it commences with debility and lassitude, which are followed by chills or rigors; it is generally composed of several invasions or exacerbations; it implicates the whole of the vital endowments and faculties, the fluids, and the entire organisation; it is acute and dangerous in its course, with lesion of the circulation, with alteration of the animal heat and of the secretions, and with diminution of vital power; and it is versatile as to its symptoms and type, with efforts at sudden changes or crises.

16. 1st, *Fever begins with lassitude and debility, generally followed by chills or rigors.* — It originates in causes which affect the vital energies of the system, and occasion debility and lassitude as the earliest and most remarkable changes. These are generally attended by an insuperable feeling of fatigue upon the least corporeal or mental exertion by stupidity, loss of nervous and mental energy, by irritability, moroseness, or impatience, and by heaviness of the eyes. Upon these supervene various uneasy sensations; as, anxiety at the præcordia, occasioning frequent full or laboured inspirations; a peculiar and general uneasiness and restlessness;

a feeling of cold, particularly along the spine, and differing from the real or usual sensation; horripilations, involuntary shudderings, and tremors or rigors. The debility giving rise to the unconquerable sense of lassitude and fatigue generally precedes the chills for some indefinite time, and accompanies them or continues after them. Chills or rigors often return and alternate with flushes, and other incipient disturbances, for a variable period.

17. 2d. *Fever is very frequently composed of several invasions or exacerbations, one paroxysm disposing to others; as in agues and remittents.* But even in continued fevers a similar circumstance very often obtains, as evinced by the evening exacerbations, and the aggravation of the symptoms on alternate days. Some writers, and more particularly HILDENBRAND, consider that, as in remittents, wherein a new invasion supervenes before the previous paroxysm had subsided, so in continued fevers, one fit runs into another. — “Continuæ ergo febres, si non omnes, saltem pleræque, præsertim criticæ, è plurimis paroxysmis febrilibus, quorum unus alterum subintrat, compositæ sunt.”

18. 3d. *Fever is a disease of all the vital endowments, functions and faculties, of the fluids, and of the whole organisation.* — If we trace the progress of fever, from the operation of its causes through successive changes, we shall find that the vital power, which is supreme over the physical properties and functions of our different structures is deeply affected throughout all its subordinate manifestations—as the sensibilities of the nervous systems, the irritability of involuntary and voluntary muscular fibres, the organic contractility of membranous parts. Hence proceed lesions:—(a) *Of the organic functions*—of the respiratory actions and functions, of circulation and of the circulating fluids; of secretion and excretion, of digestion, assimilation, sanguification, and nutrition; of the appetites, both natural and acquired, &c.—(b) *Of the cerebral and animal faculties*—of the functions of sense and voluntary motion, and of the powers of mind: the expression of the countenance and the attitudes are changed; the senses either perform their parts imperfectly, or the mind takes an insufficient cognisance of their reports; the attention is wavering and quickly fatigued; the intellectual powers and states are languid, feeble, or otherwise disturbed; the judgment is perverted by internal and involuntary impressions and conceptions; and ultimately all the mental endowments become exhausted and disordered, by prolonged wakefulness, or overwhelmed by a continued sopor.—(c) *Of the fluids and whole organisation*—The fluids and soft solids undergo change in their appearances, form, and properties. The blood is evidently altered in various ways at different periods of the disease. Its serum is often at first in considerable quantity, and its crassamentum loose; but afterwards the latter generally becomes more firm or cupped; and ultimately again loose, or imperfectly separated from the serum. In many cases it is still more remarkably altered, as shown in the article BILIOUS (§ 78 et seq.) both in colour and consistence. The secretions, which are at first chiefly diminished in quantity, ultimately are changed in quality. They become more offensive, of a darker colour,

some respects a depuratory effort of nature, more especially as those evacuations generally occur through the medium of organs which eliminate hurtful materials from the circulating fluid. Hence, one of the safest modes of practice is that which keeps these salutary processes in view, avoiding whatever may prevent them, and promoting their evolution; attending at the same time to the preservation of the powers of life, and warding off danger from weakened, over-excited, or oppressed organs.

23. When we take into consideration the conservative influence of the vital energy, the salutary changes brought about by it, and the circumstance that every method of cure, or every agent, cannot act in a similar manner in all cases — and that, even during the most injudicious treatment, certain of the agents are calculated to meet the exigencies of some cases, either in supporting the powers of life, or in favouring or determining some critical evacuation — the reason will readily appear, why recovery often takes place in fever from the most opposite means, or when left entirely to nature; and we shall easily understand wherefore all do not die who are improperly treated, and how nature often not only overcomes the disease, but also the effects of injurious agents prescribed for it. Of the means which are employed in the treatment of fevers, there are not any which become more dangerous from inappropriate use, than the extreme measures frequently resorted to — namely, large depletions and active stimulants. The former may destroy, in a few hours, cases which nature or opposite measures might have preserved, and the latter may over-excite, and inflame to disorganisation, viscera which require to be unloaded, or to have their actions moderated.

24. It not infrequently, however, happens that the critical efforts are imperfect owing to exhausted vital power, or insufficient from the nature and severity of the disease, or misdirected or irregularly exerted in consequence of some controlling or determining influence; and hence they become sources of increased disorder, or superinduce structural change. Such results are sometimes favoured by over-active, inefficient, or inappropriate means of cure; and very often by organic lesions having taken place in so great a degree, and so early in the disease, that the salutary efforts attempted cannot subdue them, but merely tend in some instances to their aggravation and danger.

25. The event in fevers is directly produced by critical changes, and indirectly by the assistance of art: it is *favourable*, if the powers of life remain unsubdued and act without obstruction; it is *unfavourable*, if they languish or are overwhelmed. So much are we indebted to the conservative efforts of life exerted throughout the frame in the cure of fevers, that more is often to be ascribed to this source than to the interference of art; and I may add in the words of Professor HILDBRAND, “Inde enim pendet, quod miseri ac inepti medici famam, quam buccis inflatis non accipere, sed verecundi naturæ magistræ reddere deberent, in febribus sanandis sibi conficiunt. Inde pendet quod omnis sectæ medici, ac oppositarum medendi rationum adsectæ, de felici eventu in febrium tractatione gloriantur. Inde demum pendet, quod quavis theoriarum ad febres curandas applicata,

sanatorum agrorum practica exempla offerre valeat.” (Vol. i. p. 53.)

26. SYMPTOMATIC FEVER. — Fever may be a concomitant or an effect of another disease, which would still remain were it possible to remove the attendant fever; but which being removed, the concomitant fever would cease. In as far as it consists of accelerated circulation, fever may be associated with the majority of diseases; but it is still merely a single symptom, wherefore other phenomena should be present before even symptomatic fever ought to be said to exist. Whatever irritates or stimulates the circulating system, to a stronger or more frequent action, or inflames a particular part, is productive of symptomatic fever. Its cause exists within the frame, and more rarely it acts from without: as irritation or inflammation of particular tissues; the presence of foreign bodies, or of calculi, worms, or hurtful ingesta; the absorption of hurtful or acrid matters, or of contaminating secretions; surgical operations, external injuries, and violent exertion. Fever proceeding from these sources has been termed *inflammatory*, *irritative*, *fever from irritation*, *fever of the vascular system*, *symptomatic inflammatory fever*, *symptomatic fever*, *chronic fever*, *hectic fever*, according to the peculiar irritation, or local disease, on which it attends.

27. Fever is associated with other diseases in a twofold manner: — 1st. *Essentially*, forming what are called *febrile diseases* or *symptomatic fevers*, strictly speaking; as in *tabes purulenta*, in which it is merely a symptom, but one which is uniformly present. 2d. *Accidentally* or *contingently*, not naturally and constantly, but merely from the association of some occasional disturbance or complication, as in amenorrhœa, chlorosis, dropsy, rheumatism, &c.; or as a consequence of treatment. In symptomatic fevers, the constitutional affection is neither so severe, nor so generally and equally extended to all the functions, nor so entirely implicates the fluids and soft solids, as in idiopathic fever. Hence they are more readily traced to their origin — to the irritation in which they arise. The functions which chiefly manifest disturbance in their progress are those of circulation and secretion — the latter often very slightly. Others are also occasionally disturbed, as those of the skin and of the nervous system, but generally in an indirect and slight manner. Consequently the chief characters of symptomatic fevers are quickened pulse, heat of skin, disorder of its transpiration, and thirst. The excretions, muscular power, and the faculties of mind, are but little altered. The pulse retains greater tone and sharpness, and the general surface more animation than in idiopathic fever. The external physiognomy, the posture, the extreme prostration of muscular power, the profound alterations of the vital endowments of the fluids and of the organisation itself, characterising the latter, are either altogether absent, or present in a very slight degree merely, unless when morbid matters are conveyed into the circulation during the course of certain symptomatic fevers, and thereby vitiate both it and the soft solids, disordering also the different secretions and excretions. Such occurrences sometimes take place, and have fallen repeatedly under my observation, particularly when inflammation attacks the internal surface of

and 1828, and in my lectures delivered from 1823 to 1827, particular notice was directed to the subject, and these symptoms were described as constituting a most important stage of the disease, inasmuch as in it the nature of fever would be most advantageously studied, and either its subsequent course remarkably meliorated, or its further progress prevented, by appropriate and energetic treatment. (*Lond. Med. Repos.* vol. xxviii. p. 238.; and other *Refer. in Bibliog.*)

34. The phenomena described above, as characteristic of idiopathic fever, never proceed immediately from the remote causes. The impression made by them occasions a succession of changes before those which really constitute fever supervene. These early changes, being productive of those which constitute the developed disease, may aptly be called *formative*; and the symptoms by which they are indicated, *precursory*. The exciting causes of fever seem to act primarily upon the nervous system of organic life, thereby producing changes in the vital manifestations of the frame, which gradually increase until they arrive at a certain pitch, and terminate in one of the modes hereafter to be noticed. The more intense the exciting causes, the predisposition being equal, the shorter will be the duration of this period, and the sooner will the lesions constituting fever be brought about (§ 15.).—(a) The earliest effect which is made manifest after exposure to the more energetic causes of fever, as infectious effluvia or noxious exhalations, is a feeling of constriction or oppression in the chest or at the præcordia, attended by frequent sighing, gaping, forced and lengthened inspirations, and by a sense of uneasy depression, or nausea, evincing the morbid impression made upon the nervous system through the respiratory organs. The pulse is weak, slow, irregular, sometimes remittent or reduplicating, and readily accelerated by slight exertion.—(b) The natural and acquired appetites and desires are diminished; nausea is readily excited by food; and the bowels are either costive or easily acted upon by purgatives; *Venus silet*, and all the *organic functions* are impaired.—(c) The patient feels debilitated and fatigued; complains of headach, vertigo, or confusion of ideas; is morose, low-spirited, sluggish, indolent, or incapable of exertion and of directing his attention long to any object; he readily perspires, and his breathing becomes short and quick, on the least exertion; his sleep is unsound and unrefreshing, and he awakens with a sense of lassitude or with pains in his back and limbs,—in short, all the *cerebro-spinal functions* are weakened or disordered.—(d) The external expression and appearance are somewhat altered. The countenance and skin are unusually pale, sallow, or unhealthy; more rarely red. The eyes are languid, and deficient in brilliancy. The breath is foetid or cool; and the tongue often loaded. The urine is sometimes pale and copious; and the cutaneous surface dry, cool, and harsh. These symptoms vary in severity, and often are so slight as to escape particular attention. They frequently are insufficient to induce the patient to confine himself.—(e) The duration of this stage is various in different fevers—from twenty-four hours, as in plague and some cases of typhus, to several weeks, as in ague; but it is generally from three

to fourteen days. The severer and the shorter this period is, the more acute and the more rapid will be the subsequent progress of the disease, and *vice versa*: there are, however, exceptions to this. Fever may be cut short in this stage by active and judicious means; but not afterwards, unless occasionally in slight cases.—(f) The *pathological conditions* characterising this stage, are, depression of vital power throughout the frame, with slight internal congestion, particularly of the lungs, liver, &c.; with imperfect change of the blood in the lungs, and with diminished secretion and excretion.

35. *B. Stage of Invasion; Principium vel Initium Febris*, Auct. var.—(a) The cold stage, of writers—is attended by debility, lassitude, painful uneasiness, or sinking at the epigastrium, a sensation resembling cold running down the back, with formication or chills extending over the limbs and general surface. The pulse is constricted, small, weak, or accelerated; the respiration is slow, irregular, or suspirious, and attended by anxiety at the præcordia, and occasionally by a slight dry cough. On these supervene gaping, sighing, pandiculation; a sense of weight, pain, or constriction in the head; giddiness, moroseness, depression of spirits, and disorder of the senses; lividity of the lips and nails; pallor of the skin; the cutis anserina, and shudderings, rigors, or shiverings, followed by or alternating with irregular flushes. After the rigors cease, a sense of chilliness often continues for some time, although the skin has become hot. These symptoms present various grades and modifications in the different types of fever: in some the feeling of cold is actually attended by reduction of the temperature; and in others the heat is not materially, if at all, diminished, or it is even increased. The former is most commonly seen in the cold stage of periodic fevers, the latter in the invasion of continued fevers. In all, however, the cutaneous transpiration is altogether arrested, and the skin is harsh and dry. The pulmonary exhalation is also diminished, and the breath is cold. Copious discharges of pale urine often take place, evidently arising out of the arrest of the exhalation from the skin and lungs. Loss of the appetites, costiveness, thirst, and occasionally sickness and vomiting, are likewise present.—(b) The duration of this period may be very short; or it may be for many hours, alternating with slight flushes. The shorter and more intense it is, and the severer the rigors, the shorter and severer will be the consequent vascular reaction, and the more nearly approaching the inflammatory type; and the longer its duration, the more prolonged will be the fever. The imperfect evolution of this stage, or its slight occurrence, particularly when it is not attended by rigors, very generally indicates a severe miasmatic or typhoid state of disease. In some of the most dangerous cases of fever, I have seen this stage so slight, as to be confounded with the preceding one. This period having supervened, the disease cannot readily be cut short by bloodletting, emetics, &c.; although in the slighter cases, and more inflammatory type, these means have succeeded in some instances.—(c) The *pathological states* of the first period are increased in this, particularly the general depression of vital endowment; the impeded functions of the lungs,

evening exacerbation, whilst, in others, exacerbations are very manifest; but this depends much upon the prevailing epidemic constitution. In general, fever caused by infection, and complicated with serious visceral disease, or characterised by severe affection of the fluids and soft solids, is strictly continued; whilst that produced by terrestrial emanations assumes somewhat of the remittent form, although presenting much of the continued type. — (c) The *duration* of this state of vascular reaction is shortest in agues, in which it does not exceed a very few hours; and, in continued fevers, it is brief in proportion to the severity of the disease. It rarely, even in the more protracted cases, exceeds fourteen days. — (d) The *pathological states* of the early part of this stage continue in great measure in this part of it; but vascular action exceeds vital power, which is gradually lowered; and the circulating and secreted fluids and the solids themselves become vitiated as already stated, and as will be more particularly shown in the sequel.

40. *D. The period of Crisis — Stadium Criseos — Judicium Febris.* — Crisis in fevers is a sudden change taking place at a particular period of the disease, and terminating it. A crisis is brought about chiefly by the efforts of nature, or, in other words, by the febrile action itself inducing changes in the functions and organs, productive of a salutary effect. Although it often takes place by the unaided efforts of life, it is frequently assisted by art, and should not therefore be preferred before art judiciously employed. The *critical days* are the 2d, 3d, 4th, and 5th (quotidian period); the 7th, 9th, and 11th (the tertian period); the 14th, 17th, and 20th (the quartan period). After the 20th, crises are obscure, and seldom occur till the 27th or 28th. Salutary changes are observed chiefly on the above, unfavourable changes on the intervening days; but death may happen on any day. A very cold climate or season, or either extreme of temperature, the impure air of an hospital, the continued operation of the causes, the complications, great vitiation of the fluids and solids, an active treatment, interfere with, retard, or prevent crises. If the exacerbations be well marked, and vital energy not very much reduced, a favourable crisis may be more confidently expected. Crises are sometimes *indecisive*, or consist of several abortive attempts before the end is attained, especially when the powers of life are much lowered. When several critical efforts are required, each succeeding one renders the task more easy for the next, until the disease is gradually subdued. (See *Crisis*, and *Critical Evacuations*.)

41. *E. Period of Decline — Decrementum — Declinatio.* — Sometimes the decline is prompt and rapid, especially after a marked crisis (see art. *Crisis*); at other times it is gradual and slow, particularly when only slight and imperfect crises have occurred, or when the disease terminates in resolution without any very manifest critical evacuation. In the former case, the decline passes quickly into convalescence; in the latter, this stage is often characterised by slight exacerbations, called by some writers posthumous crises, which are apt to be misunderstood. In the fevers of this country, which frequently decline gradually, or in the second of these modes, the symptoms indicative of vital disturbance ge-

nerally subside in the order in which they appeared. Organic nervous influence and the dependent functions are the first to be restored; the respiratory, secreting, and excreting actions become natural; the perspiration more general, free, and, if it have previously been offensive, clammy, or partial, more natural and genial; the tongue begins to clean on the sides and point, and is more moistened by the commencing return of the secretions poured into the mouth; coma and delirium subside; and the patient regains his power over the alvine excretions, if it has been lost; the sensorial faculties and sleep reappear, and the latter becomes more refreshing; the locomotive powers are freer and more energetic, the patient being enabled to turn upon his side, the sense of soreness and lassitude being diminished; the appetites and desires return, and the excretions are gradually re-established. The action of the heart is the last to subside to its natural frequency, and generally continues long afterwards to be readily excited by slight stimuli. The urine is abundant, and deposits a copious sediment; the bowels become free, the motions consistent and seculent, and the skin gradually assumes a clear and healthy appearance; but emaciation increases rapidly, or now is more apparent; absorption, more especially of the less animalised and less highly organised parts or molecules, proceeding rapidly as soon as vascular reaction subsides.

42. *F. Convalescence — Stadium Refectionis — Convalescentia.* — I agree with RICHTER and HILDENBRAND in considering this as a stage of fever. The propriety of this view is obvious, especially as regards the future health of the patient. It is, however, altogether distinct from the *relapse*, inasmuch as it does not present any of the constituent phenomena, which still continued to exist in the stage of decline, but merely those of debility consequent upon acute disease. During its early progress, the bulk of the body still continues to diminish, or does not increase until it is far advanced; all the symptoms entirely disappear; the appetites, desires, digestive functions, the secretions and excretions, are re-established, but are apt to be disordered, and therefore require supervision; the cuticle and sometimes the nails are exfoliated, and the hair falls out. Irritability and sensibility often are increased; and *tonitru aurium* is sometimes troublesome; but these subside as health is restored. — *Relapses* are apt to occur in this period, especially from premature exposure or indulgences, or from disorder of the digestive organs; but they more rarely follow when fever arises from infection or from a specific contagion, though other diseases may be thereby occasioned.

43. IV. OF THE TYPES AND FORMS OF FEVER. — i. These are determined by the following circumstances: — a. By the *previous health*, the *temperament*, and *habit of body*, and *vital energy* of the patient; — b. By the *state of the vascular system*, particularly as to the existence of *fullness* or *deficiency of blood*; — c. By the *specific kind of miasm* or *cause* exciting fever; — d. By the *prevailing epidemical constitution*; — e. By *other causes*, *predisposing*, *exciting*, *concurrent*, and *determining*; and by the *intensity of the action*; — f. By the *external and internal — the physical and moral — influences*, to which the patient is subjected, from the period at which

without any critical discharge. This is the most frequent mode observed in the fevers of this climate; and results, in a great measure, from the treatment adopted for them, particularly in their early stages, which generally interferes with, or prevents the occurrence of, the natural evacuations constituting *crises* (see this article). It is chiefly when artificial evacuations have not been pushed far, that crises manifest themselves.

47. *B. Terminations in other diseases* are owing—*a.* to previous disease, or the condition of particular viscera at the time of attack;—*b.* to the severity and concurrence of the causes, and the intensity of the disease;—*c.* to local determinations supervening during the progress of fever, giving rise to complications;—*d.* to improper treatment, as a too heating regimen, the continued use of cathartics, or the adoption of such as are too irritating;—*e.* to incomplete or imperfect crises;—*f.* to the too early or too liberal use of stimulants or tonics during the disease, or during convalescence;—*g.* to the continued operation of the causes during treatment;—*h.* to the occurrence of new, determining, or superadded causes, as crowding of the sick, bad ventilation, mental perturbations, in the progress of the malady;—and, *i.* to neglect, and to a blind confidence in the efforts of life. *The diseases* which may be thus superinduced, are—*α.* inflammations of particular organs;—*β.* engorgements, obstructions, and enlargements of glandular viscera, particularly the spleen or liver;—*γ.* effusion of serous fluids into shut cavities, as into the peritoneal and pleural sacs;—*δ.* partial or general anasarca;—*ε.* ulceration or abrasion of mucous surfaces—chronic diarrhoea and dysentery;—*ζ.* hæmorrhage from mucous membranes;—*η.* inflammation of some part of the vascular system;—*θ.* apoplectic, paralytic, or epileptic seizures;—*ι.* mania and insanity in some one of its forms.

48. *C. A termination in death* is favoured—*a.* by constitutional vice, excessive vascular fullness, and a bad habit of body;—*b.* by the intensity of the cause and of the disease;—*c.* by the continued operation of the chief causes;—*d.* by the nature of the complication;—*e.* by neglect or improper treatment;—*f.* by unfavourable crises;—and, *h.* by the other circumstances just mentioned (§ 47.) as productive of consecutive diseases.—This result cannot be imputed to any single change. Two or even more of the following are evidently concerned in its production:—*α.* Extreme suppression of organic, nervous, or vital power;—*β.* Lesions of organs arresting their functions, and impeding those actions necessary to continuance of life;—*γ.* Vitiating of the fluids, changing the condition of, or destroying, nervous influence and the rest of the vital manifestations;—*δ.* Exhaustion of vital power, and alterations of the intimate organisation of the viscera, as in malignant fevers;—*ε.* Organic injury sustained by the nervous system, especially its larger masses;—*ζ.* Diminished or exhausted irritability of the heart, the patient expiring as in fatal syncope;—*η.* Suffocation from effusion into the bronchi;—*θ.* Congestion of the lungs, heart, and large vessels, to an extent beyond the vital power of these parts to overcome;—and, *ι.* Deficiency of blood so considerable as to destroy the relative conditions of the contained fluid and

containing vessels; for when the tonicity, the organic contractility, of the latter is much impaired, as in the advanced stages of adynamic fevers, and the amount of circulating fluid is also greatly lessened, the vessels will be unable to accommodate themselves to their contents, and the consequences must necessarily be most dangerous, if not speedily fatal.

49. VI. OF THE APPEARANCES AFTER DEATH.—*A.—a.* Cases have been met with, wherein the most careful examination has failed to detect any lesion, or strictly morbid appearance, in any of the general systems, or individual textures, or in the fluids contained in the large vessels. It must be admitted, therefore, that changes may take place in the nervous system, or in the blood, sufficient to cause the most acute disease, or even to subvert life, without being so gross as to be demonstrable to our senses; but allowing this, the fact now stated is important, inasmuch as it most materially affects the question as to the nature of fever.—*b.* Other cases have been observed—and much more frequently than the foregoing—in which the morbid appearances were not commensurate with the intensity of the symptoms referrible to their seats, and were quite insufficient to account for a fatal issue.—*c.* Frequently also, lesions of parts have been discovered, which were not indicated by symptoms, or by the usual symptoms, or very slightly and imperfectly; those changes having been more or less, or even entirely, latent during life, although their nature evinced their existence and progress during the advanced stages of the disease. This circumstance may have arisen from an oppressed or exhausted state of the brain; or from the changes in the circulating fluid impairing sensibility; or, as Dr. ALISON suggests, in his very able and lucid exposition of the Pathology of Fever, from an enfeebled state of the circulation at the time when these local affections take place.

50. *B. As to the nature of the changes observed.* opinions are somewhat different.—Many writers have viewed them as purely inflammatory; others as consequences of irritation, or of inflammatory irritation; this condition being viewed by them as a lesser grade or modification of inflammation. It is important to entertain precise ideas as to their nature; and to mark the circumstances in which they differ from those changes indisputably resulting from pure inflammation, particularly as occurring in a previously healthy constitution.—1st. The lesions observed in fevers rarely present effusions of lymph or pus, especially in the adynamic and typhoid fevers,—consequences commonly following true inflammation; and the cases in which these effusions have been detected, have been instances of local inflammation supervening in the course of the more sthenic or inflammatory forms of fever.—2dly. The lesions or inflammatory appearances have been more superficial, diffused, and attended with a darker discolouration, and greater softening of the affected and adjoining parts, than in idiopathic inflammation.—3dly. The appearances thus characterised, differ the more from inflammation, the lower the type of fever and the more vitiated the circulating fluids.—4thly. They more nearly resemble erysipelatous inflammation, than any other.—5thly. They are met with in certain tissues more frequently than in others; and, excepting debility

signs and tendency of these changes, as well as the reputation of the physician. — It is often difficult, owing to the mutability of the disease, and to the liability to err in appreciating those signs by which changes of the functions and of the organisation are indicated, particularly when the chief manifestations of life, and sensibility and organic contractility, are more or less impaired or perverted during the course of fever. The prognosis depends, generally, upon the following circumstances: — *a.* The nature and intensity of the predisposing, exciting, and concurring causes; — *b.* The character of the prevailing epidemic, or epidemic constitution; — *c.* The type, form, and state of the disease; — *d.* The states of the various functions, and of nervous and vital energy; — *e.* The congruity of the symptoms, and various contingent phenomena; — *f.* The influences, treatment, and regimen to which the patient is subjected; — and, *g.* The entical or other changes which may take place.

58. *A.* — *a.* The predisposition caused by debility, acute sensibility, or a plethoric and cachectic habit of body; a previously morbid, or congested state of the internal viscera, particularly of the liver, bowels, and spleen; and advanced age; increase the danger from fever. Some epidemics, however, most frequently attack the young and robust, and prove even more fatal to them. But, although *sporadic fever* may be also common in this class of patients, it is less dangerous in them than in the foregoing. — *b.* The exciting agents, particularly specific animal miasms; their concentrated form; the concurrence of several causes, either contemporaneously or in quick succession; their prolonged action, or continuance during the disease; and certain of the circumstances, inducing unfavourable terminations (§ 48.); render the prognosis much more serious. Some importance should also be attached to the character of the prevailing epidemic, as respects its open or insidious form, and the effects following a treatment appropriate to the usual states of the disease.

59. *B.* — *a.* The intermittent type is less serious than the remittent, and this latter than the continued; but the more the fever is inclined to change, to become irregular, or to pass into one of a graver character, the more serious it is. The more complete the intermission, or the remission, so much less is the danger; and the more disposed continued fevers are to evince a remitting form, the more favourable is the circumstance. The longer fever has continued, the more difficult will be the cure; and relapses are more unfavourable than first attacks. — *b.* The inflammatory and athenic species are much more generally favourable than the adynamic forms. — *c.* The simpler the fever, the more certainly will recovery take place; and the more complicated, the greater is the danger. The adynamic form, with predominant affection, of an important internal organ, especially the intestinal mucous surface, or the brain, or the lungs, is accordingly amongst the most dangerous; more especially if the vascular system and circulating fluids, or the soft solids, also become vitiated.

60. *C.* The more that the organic nervous influence is suppressed, diminished, or disordered throughout the different viscera, the more unfavourable should be the prognosis; the functions of

the viscera, the state of the fluids and secretions, and the appearance of the soft solids, evincing the extent of the disorder and of the danger. — A weak, small, and quick pulse; a dark, dry, and contracted tongue; profuse, offensive, viscid, and unnatural perspirations; watery, foetid, flaky, membraniform, and unhealthy stools; discoloured, scanty, and brown urine; livid or discoloured nails, fingers, eyelids, lips, and nose, independently of the cold stage; a discoloured, dark, and dry mouth and throat; and an offensive and penetrating odour proceeding from the patient; — are dangerous symptoms. A pulse of 120 or upwards, unless in the puerperal state, is unfavourable, and so much the more so as it is above this number. A brown or black coating, and deep, reddish fissures, or a dark or livid colour of the tongue; stridor of the teeth; a movement of the lips and lower jaw as if eating; firm closure of the jaws and lips; extreme anxiety at the precordia; tumefaction, tenderness, or pain of the epigastrium, hypochondria, or abdomen generally; tympanitic or flatulent distension of the abdomen; copious or repeated discharges of blood by stool; a sudden irruption of the catamenia, and an equally sudden disappearance of them; a moaning, weak, quick, abdominal, or gasping respiration; coldness or rawness of the expired air; hiccup; excessive increase, or diminution, or irregular distribution, and otherwise morbid state, of the animal heat; sunk features; rapid emaciation; great difficulty or impossibility of acting upon the skin by sinapisms or blisters; an early, or deadened, unnatural, lurid appearance of the external surface; yellowishness of, or petechiae and livid or purple blotches on, the skin; and dark mucous sordes on the lips or gums, or mucous discharges from the latter or from the nose; — are very unfavourable circumstances.

61. *D.* The unfavourable symptoms, more directly depending upon the cerebro-spinal nervous system, are, — *a.* extreme pain of the head, excessive sensibility or depression of spirits; turgid or red countenance, injected watery eyes, contracted brows, &c., quickly passing into delirium, sopor, or coma; prolonged watchfulness, or early somnolency or torpor; convulsive movements, trismus or spasms of parts, great restlessness, and continued tossings; despair of recovery; and a presentiment or feeling that death will ensue: — *b.* And still more unfavourable are, early mental indifference, particularly to the issue of the disease; insensibility or sopor; profound coma, and difficulty of being roused; relaxation of the sphincters, and unconscious evacuations; excessive loss of muscular power; inability to retain any other than the supine posture, especially early in the disease, and in connection with extreme pain in the back and loins; falling down towards the foot of the bed; a position of the limbs and body, depending upon their gravity, and different from that usually preferred by the patient; inability to assume a posture different from that in which he is placed; picking with the fingers at the bed-clothes; subultus of the tendons; catching after objects in the air; alternate dilatations and contractions of the nostrils during respiration; loss of voice or speech; trembling of the tongue, or inability to protrude it; an open mouth or relaxation of the lower jaw; difficulty of deglutition; and dilatation and insensibility of the pupil.

dread which gave rise to such a medium or mode of deprecation* not only marks the destructive prevalence of fevers in these countries, but also indicates the noxious effects of the Pontine Marshes in the time of the Roman republic.

67. The earliest opinion of the ancient Greeks respecting the immediate cause of fever appears to have been that of ANAXAGORAS (PLUTARCH, in *Vita PERICLIS*, p. 155.) ; etiam ARISTOTLE, (*De Gener. Anim.* l.iii. cap.6.)—the contemporary of HIPPOCRATES. He attributed all acute diseases to an abundance of bile. ARISTOTLE (*De Part. Animal.* l.iv. c.2.) combated this doctrine; but it became prevalent nevertheless. HIPPOCRATES, instead of entering into speculations which the want of data and first principles rendered futile, set a better example, by directing attention to the varying phenomena of the disease, and to their relation with the vicissitudes of season, &c. PLATO (*TIMÆUS*, p. 497.; et GALEN, *De Dogmat. Hipp. et Plat.* l.viii. p.324.) considered that fevers, and, indeed, all diseases, arose from a disproportion of the different physical elements which enter into the composition of the body. Continued fevers, he supposed to arise from superfluity of fire; a quotidian from abundance of air; a tertian from predominance of water; and a quartan from that of earth. This is, perhaps, the first attempt at explaining the types of fever. It appears to have had but little influence, notwithstanding its universal adoption, in changing the modes of practice already recommended by HIPPOCRATES.

68. The dogmatists (GALEN, *de Nat. Hum.* p.279.) of the following age, in conformity with their doctrine, conceived fever to proceed from the abundance of bile, its quantity determining the type of the disease. The *maximum*, in their opinion, produced continued fever of an ardent character; a less quantity, quotidians; and the *minimum*, quartans. PRAXAGORAS (RUFFUS, lib.i. chap.33. p.109.) of Cos, one of the most faithful followers of Hippocrates, adopted a similar theory, and endeavoured also to account for the cold stage of the disease, by supposing its source to exist in the vena cava. This opinion possesses some features of the more modern doctrine of congestion, which no doubt exists, both in the vena cava and other large veins, during the cold stage, as a part of the series constituting the diseased actions which obtain the name of fever. ERASISTRATUS was the first who contended for a connection between fever and inflammation (GALEN, *Comment. II. in L. de Nat. Human.* p.27.). He conceived these morbid states to consist in a transfusion of the blood into the arteries, disturbing the spirit they contain, and giving it an irregular direction. The former he believed to arise from the presence of blood in the large arteries; the latter, from a congestion (*στέφανσις*) of this fluid in the capillaries (*Ibid. de Venæsect. adv. Erasist.* p.2.). He was equally averse from bleeding and purging, which had been long and generally in use in the treat-

ment of these maladies; and in conformity, as he supposed, with his theory, recommended spare diet, emetics, lavements, warm baths, frictions, &c. (*Ibid.* p.15, 16.)

69. ASCLEPIADES, the founder of the Methodic School, adopted a great part of the doctrine of ERASISTRATUS respecting the fundamental corpuscles, and the *pneuma* or spirit of the dogmatists. He explained the heat which takes place in fever, by the motion of these corpuscles; and accounted for sensation, pain, &c. by a similar hypothesis (CÆLIUS AURELIANUS, l.i. c.15. pp.46.48.57.). According to him, fever consists in an increase of heat, and of the pulse (*Ibid.* l.ii. c.33. p.151.). The other phenomena of fever and of inflammation, he considered to proceed from a disproportion between the particles and their pores. The elementary corpuscles, he supposed to pass from the lungs into the heart and arteries, and to produce occasionally, during their volatilization from the body, an obstruction in the channels through which they circulate; the larger causing the most obstinate obstruction, and, consequently, the most violent fevers: and the lesser, slighter attacks. The type of the disease was explained after the same manner. The longer the intervals between the febrile accession, the more subtile the atoms were supposed to be which had become impacted in the vascular pores (*Idem. Acut.* l.i. c.13. p.42.). ASCLEPIADES conceived that nature could do nothing of herself in removing this state, and that it must be attempted by the physician. CÆLIUS (lib.iii. c.8. p.469.) informs us, that "Asclepiades officium medici esse dicit, ut tollat, ut celeriter, ut jucundè curet." Agreeably to this maxim, he prescribed gentle medicines, and dietetic means, instead of the violent remedies of the empirics (CÆL. AUREL. *Acut.* l.i. c.14. p.44.). Enemata, bloodletting, dry cupping, frictions, gestation, exercise, bathing, and, more rarely, emetics, were the agents which he recommended. (PLINY, lib.xxvi. c.3. p.392.; CÆL. AUREL. l.c. et lib.iii. c.8. p.215.)

70. SORANUS (CÆL. AUREL. *Acut.* l.ii. c.33. p.153.) conceived fevers to consist in an absolute relaxation of the vessels and their pores. CASSIUS, the Eclectic (CASSI *Iatroscopistæ, Naturalis et Medicinales Questiones*, Ed. CORR. GRÆVIER. Tigur. 1562.), was of opinion, conformably with the chief doctrine of the Methodics, that they arose in consequence of a different arrangement taking place in the primary and invisible corpuscles; while he adopted the hypothesis of the more ancient dogmatist, by considering the increase in the temperature to be the result of friction between these particles, disengaging their integral heat. The views of fever adopted by the Eclectics, led to few modes of practice which had not been previously employed. HERODOTUS (ORIBASIIUS, *Collect.* l.vi. cap.28. p.228. et passim), the disciple of AGATHINUS, who embraced more of the pneumatic system than of any other, placed great confidence in warm bathing and in sudorifics. These he considered to be serviceable, by fortifying the *pneuma* or spirit, and assisting it to expel heterogeneous particles. He attempted, also, to determine, with more precision, the time and circumstances in which bleeding, as recommended by HIPPOCRATES, ought to be prescribed.

71. GALEN (*De differ. Feb.* lib.i. *passim*) attri-

* The following is from a votive tablet to the goddess:—

*Febri. divæ. Febri.
sanctæ. Febri. magnæ.
Camilla. Amata. pro.
filio. male. affecto. p.*

TOMMASINI, in GRÆVIER, *Thesaur.*
Roman. Antiq. t. xii. p. 867.

however, has been stated to show that his facts are more valuable than his doctrine.

76. THOMAS CAMPANELLA*, the celebrated Italian metaphysician and pathologist of the sixteenth century, discarding the opinions of ARISTOTLE, conceived that the vital spirit, which is produced from the most subtle of the animal humours, and is nourished by the blood, is concerned in the production of all diseases, although itself undergoes no change, being only irritated or excited by the æriform matters and flatuosities contained in, or proceeding from, the fluids. He considered that, as respects its nature, fever can scarcely be called a disease, since it results from the reaction or the efforts of the vital spirit to resist vitiation and putrefaction of the fluids, and thus to preserve life. He attributed the crisis and critical days to lunar influence, and explained the action of remedies on the principle of their exciting or reducing the temperature of the body. VAN HELMONT (*De Febris*, c. 16. p. 783.) ascribed fever to the influence of the archeus or vital principle.—Although the foundation of the doctrine, which afterwards became so generally adopted, owing to the form it assumed in the hands of HOFFMANN, CULLEN, and others, was laid by these writers, another theory was soon afterwards promulgated. Owing to the increasing enthusiasm with which chemistry then began to be cultivated, the *chemical pathology* first proposed by PARACELUS (*Op. Omnia Med. Chémico-Chirurg.* 4to. Basil. 1589.), and supported by SYLVIVS (*Op. Med.* 4to. Amst. 1679.), WILLIS (*Oper. Omnia*, 4to. Geneva, 1680.), KENGER, BORELLI (*De Motu Animal.* pars i. et ii.), WEDEL (*Physiol. Med. et Pathol.* 4to. Jenæ, 1679.), and others, obtained a very general support; and although all the phenomena of fevers were not explained by some according to the principles of this school, yet its doctrines were conveniently adduced to account for various states of disorder.

77. It is unnecessary to notice the dreamings of FLUDD, DIGBY, MAXWELL, GREATRAKE, and others, of the sect of the Rosicrucians, which appeared early in the seventeenth century, as to the nature of fever. It is impossible to cast even a glance at the ravings of this sect, without entertaining ideas the most humiliating of human nature and intellect. Yet they found followers in Europe, particularly in Germany, as late as the middle of the eighteenth century; and, even now, emanations of their doctrine may be traced in some of the reveries which have recently been promulgated in that enquiring country. Leaving opinions calculated only to excite the most humiliating suggestions respecting the extent of human knowledge, and equally abasing reflections on the state of medical science in this country at that epoch, we arrive at a period presenting opinions more in accordance with calm and unbiassed reason than those immediately preceding.

78. The writings of SYDENHAM (*Opera Omnia*. Leyd. 1742, 8vo. best edition) tended to dissipate the "thick-coming fancies" of the humoral

and chemical pathologists; and, although tainted by the chemical hypothesis, he nevertheless directed attention to the operations of nature. BAGLIVI (*Op. Omnia*, Ven. 1716, 4to.), at a later period, trod nearly in the same path as SYDENHAM; and, like him, attended to the prevailing character of epidemics, and viewed their phenomena in connection with the seasons and atmospheric vicissitudes. STAHL (*Theoria Med. Vera*, 4to. Matæ, 1737.), the disciple of WEDER, forsaking the doctrines of his master, adopted a theory in many respects similar to that proposed by VAN HELMONT (*Op. Omnia*. Amst. 4to. 1664) and CAMPANELLA. The psychico-chemical, or bio-chemical, hypothesis of STAHL subsequently received the support of SAUVAGES (*Noëd. Meth.* 2 vols. 4to. Amst. 1768.), who, in addition to the efforts of the anima, the increased motion of the fluids, and augmented secretion and excretion of the salino-sulphureous particles, added the doctrine of BOERHAAVE, of accelerated circulation to remove a mechanical obstacle.

79. Although recent opinions as to the proximate cause of fever may be traced partly to FERNELIUS and others, yet it is to HOFFMANN (*Le Generat. Febr.* Halæ, 1715.), the contemporary of STAHL, that we are indebted for some excellent ideas. He placed the chief source of motion in the nervous system, and considered that certain affections of nervous influence induce a general spasm of the extreme vessels, driving the blood from the capillaries into the large vessels, the heart and large arteries thus becoming irritated. A nearly similar hypothesis was afterwards framed by BOERHAAVE (*Prælec. Acad.* 2 vols. Goet. 1744.) from opinions entertained at different periods, more particularly from some of those promulgated by HOFFMANN. BOERHAAVE, adopting no single general principle, to which alone he referred the different manifestations of fever, kept his attention more especially fixed upon the relation subsisting between the exciting causes, and the action they induce in the system, explaining at the same time the latter conformably with the pathological doctrines of the time. He considered that a quicker and a stronger action of the heart was induced, during fever, by an accession of the influence of the brain and the cerebellum, in order to overcome the resistance offered by the smaller vessels; and that fever was therefore an exertion of life to avert death. CULLEN (*Four Lines of Pract. of Phys.* vol. i. p. 42.) illustrated in a much more satisfactory manner, the doctrine of the living solid, as first proposed by FERNELIUS, and so ably extended, and, indeed established, by HOFFMANN. The application of it to the theory of fever, which had been made by these and other writers, was more precisely explained by CULLEN, and more conformably with many of the phenomena. The opinions of this very acute and philosophical physician held a stricter reference to the early changes than had been generally entertained. The cause of fever he supposed to act by debilitating the nervous energy, inducing diminished influence of the brain, and consecutive atony of the superficial capillaries, accompanied with spasm; reaction of the heart and larger arteries supervening as consequence of this state. This doctrine was farther illustrated and modified by CUNATZ (*Medi-*

* Born in 1568, and imprisoned for his metaphysical opinions from 1599 to 1629, when he was set at liberty by Pope URBAN VII. He afterwards went to Paris, where he died in 1639. (TIRABOSCHI, *Storia*, &c. t. vii. p. 140.; CAMPANELLA, *Metaphys.* l. ii. p. 39; et *Medecina*. l. i. c. i. art. 1—4. 8vo. Leyd. 1635.)

has distinctly ascribed fever to inflammation of the brain, he having remarked, in 1757, this organ especially affected in an epidemic characterised by malignant symptoms; and Dr. WENDELSTADT, in his description of an epidemic that prevailed in 1794 and 1795 in Wetzlar, attended by delirium in some cases, by catarrh or pneumonia in others, or by both delirium and pneumonia, considered inflammation of the brain to have occurred from the commencement. Still the existence of essential fever cannot be said to have been called in question, until the appearance of the works of PLOUCQUET (*Exposit. Nosolog. Typhi*. Tubing. 1800.) and CLUTTERBUCK (*Inquiry into the Seat and Nature of Fever*. Lond. 1802.), in which this disease is ascribed to inflammation of the substance of the brain. This doctrine was soon afterwards controverted by Dr. BEDDOES (*Researches concern. Fever as connected with Inflamm. &c.* 8vo.); but MARCUS, of Bohemia, forsaking the pathology of BROWN, became a convert to it, and its most zealous supporter (*Ephemer. der Heilk.* b. i. st. 2. &c. 1809.); and other writers of inferior note espoused the doctrine both in MARCUS's *Ephemerides* and in HORN's *Archives*.

84. Shortly afterwards, another theory of fever made its appearance; and in France, at least, attracted considerable attention, owing to the copious writings of BROUSSAIS and of his pupils. This pathologist maintained that the mucous membrane of the digestive canal is the primary seat of fever, and presents the most general and unequivocal lesions after death; affections of other organs being merely consequent upon, or sympathetic of, disease of this part. Although several writers, especially RAHN (*Briefwechsel, &c.* p. 250. Zurich, 1787.), and BEDDOES (*Op. cit.* p. 63.), considered the gastric system most frequently affected in fevers, it was reserved for BROUSSAIS to conclude that "all the essential fevers of authors are to be ascribed to gastro-enteritis, simple or complicated." (*Exam. des Doct. Med. &c.* t. i. p. 34.)

85. These two theories are the most important of those which have had reference to the local origin and seat of fever. They are manifestly founded on narrow views of the deranged actions consequent upon prolonged mental depression and anxiety—upon change of climate, season, and weather—upon the operations of endemic agents and epidemic influences—upon the action of various infectious miasms—according as each or several of them may affect persons differently predisposed, by temperament or diathesis—by habit of body and constitutional energy—by the state of the secreting and excreting viscera—and by the circumstances in which they are placed. They appear also to be deduced from mistaken conceptions of the actual sequence of the disordered actions characterising the various species of fever—sporadic, endemic, epidemic, infectious, &c.—however they may be associated or complicated with more or less local disease, either at their commencement, or in their progress.

86. The opinions which have recently been most adopted on the Continent, especially in Germany, are those which were taught by J. P. FRANK (*De Curandis Hom. Morbis, &c.* t. i. p. 34.) and V. N. ab HILDENBRAND (*Institut. Pract.* t. i. p. 96.). The former of these writers

confesses that he despairs of conveying any exact idea, or even of coming to any satisfactory conclusion, respecting the proximate cause of fever. He thinks, however, that fever may be viewed as resulting from irritation induced by an unaccustomed stimulus, the powers of life reacting, or making efforts at reaction, in order to remove it. HILDENBRAND states nearly the same proposition in different words, in concluding that the cause of fever is to be found in a morbidly increased reaction of the vital forces, owing to the irritation of a morbid stimulus. He further remarks—1st, That all fevers are caused by an absolute or relative irritation, and consequently that they are all at their commencement irritative;—2dly, That the reaction of fever never follows mere debility, although it is attended by debility; and that the debility of the vital powers is always secondary and the effect of the morbid irritation, or, adventitious as in the progress of the disease.—Admitting that it is difficult to explain—although I think it quite possible—how reaction of the vital forces can take place in the system in consequence of a cause primarily producing debility, more especially in the part where the impression is primarily made; still it is evident that all the causes of fever are not positive stimuli or irritants in their primary action, and consequently that their immediate effects on the surface to which they are applied are not exciting. Indeed, we have no evidence that the effects which are proximately consequent upon their application, are similar to those which uniformly result from those stimuli, with the action of which we are acquainted. Stimulating effects undoubtedly follow, remotely, in a majority of instances, but they supervene in consequence of intermediate operations taking place in the system itself.

87. The opinions of Dr. JACKSON are not materially different from those of HILDENBRAND. He considers the material cause of fever to be of an irritative kind;—that it enters the body by the absorbents of the first passages, proceeding into the circulation; and that it produces the febrile act by irritating the extreme series of organic capillaries, thereby occasioning subversion of the existing mode of action, and giving rise to changed or unnatural forms of action, through which the different secretions and functions are diminished, increased, or modified, in various ways and degrees.

88. I am not aware that any opinion has been promulgated different from those now briefly stated, up to the period when my own views on the pathology of fever were published. Dr. ARMSTRONG was the most copious and recent writer on fever at that period; but, after an attentive perusal of his work on typhus, and of his published lectures, I am unable to ascertain what his views are, or wherein they differ from those generally entertained at the time, especially from those previously published by Dr. JACKSON, excepting that he particularly insists upon congestion, as an important pathological state in some forms of the disease;—but in this he merely followed STAHL, JUNCKER, R. SPRENGEL, JACKSON, and some other older as well as contemporary Continental writers. Upon the whole, his views, both pathological and practical, are as contradictory and vacillating, that a reference cannot be made to them with any degree of confidence.

89. IX. PATHOLOGICAL STATES—i. The EARLY

common than the other inflammatory appearances, in no way supports this doctrine of fever, inasmuch as it may be present to the extent observed in most instances of fever, without causing much disturbance, or it may supervene shortly before death, or even immediately after dissolution. But readily granting its existence even early in the disease, it is merely one of several changes consequent upon others much more important, as will appear in the sequel (§ 92.).—*g.* Those who believe in the inflammatory origin of fever do not agree respecting the particular viscus which is its especial seat; some assigning one organ, others another: the diversified complications, or predominance of morbid action in one viscus, or even in several, over others, in different cases and epidemics (*e*), furnishing them with the only arguments they can assign in favour of their opinions.—*h.* The changes supervening in the blood, in the secretions, and in the general organisation, during the progress of fever, cannot be explained by, or reconciled with, its origin in local inflammation.—*i.* The appearances considered inflammatory, and to which this class of pathologists refer in support of their doctrine, most frequently take place in the progress of fever, and seldom at its commencement, as shown by a careful observation of the symptoms.—*k.* The tendency to a favourable termination, and to natural crises, is much more remarkable in fevers, than in inflammations.—*l.* The general characters of fevers vary remarkably in different epidemics and epidemic constitutions,—a circumstance not remarked in respect of inflammations, or in a much slighter degree,—and lastly, the *juvantia* and *ledentia*, in both respectively, indicate a great difference between them. The extent to which depletions can be carried in both, and the frequent benefit derived from very opposite measures in the former, and which are injurious in the latter, are also no mean proof; for although vascular depletions are often requisite to control the local determinations or even inflammations which supervene in the course of, or early in, fevers, yet they cannot, owing to the state of vital power, be carried so far as in pure inflammations; and, although evacuations are most necessary in some epidemics, and tonics or stimulants injurious, still the former cannot be practised to the same extent, at least in this climate, as in the phlegmasiæ; whilst in epidemics of an opposite character, bleeding is often injurious, and opposite means are required,—a circumstance not observed respecting inflammation.

92. *B.* Certain of the arguments now urged are equally applicable to the doctrine of congestion, or irregular distribution of the blood.—*a.* The espousers of this opinion do not agree among themselves as to the chief seat of congestion; but granting that congestion very frequently, or even generally, exists at some period of the disease, especially in the large vessels adjoining the heart, it is only one link of the chain of morbid causation and action, itself being caused and attended by, as well as inducing, other changes equally important. Besides, those instances which occasionally occur of remarkably great congestion of the large vessels of internal viscera, as from asphyxy, &c., are not followed by the phenomena of idiopathic fever; and although, as I shall have to show hereafter, many of the worst forms of fever

are attended by congestion as one only of the various changes that characterise them, yet others of a slight kind, as ague, are accompanied with still more remarkable congestion during the cold stage of each paroxysm, without further mischief than the subsequent reaction which it aids in developing.—*b.* When congestion becomes considerable, it is referrible to the noxious influence of the exciting causes exerted primarily upon the organic or ganglial nervous system, and consecutively upon the vascular system; the action of the heart being thereby weakened, and the tone and resiliency of the vessels impaired; and hence, when the morbid impression on the former is very intense, the effects produced upon the latter are also severe, congestion being only one of these effects.—When, in consequence of the persistence of the morbid impression, or change primarily produced in the ganglial nervous system, the effects upon the heart and vessels continue, the resulting congestions, with the other concomitant lesions, either cannot be removed, or are removed with difficulty; the heart being rendered unable to exert a due reaction in order to overcome them; the vessels being incapable of that degree of tonic resistance necessary to a healthy circulation and a regular distribution of blood, and the capillaries being impaired in all their functions, owing to the state of nervous power influencing them, and of the circulation in them. Thus congestion is established as one of the more evident lesions that follow the primary changes in fever,—but only as one of subordinate importance.

93. *C.* To the doctrine that imputes fever to the direct contamination of the circulating fluid by the material cause, the following objections may be urged:—*a.* The febrile cause, acting as a poison, should instantly affect the appearance of the blood if it made its first and principal attack in this way; but, when the cause is energetic, the effects, instead of progressively and gradually appearing, as they necessarily would do in this case, instantly manifest themselves in the functions of the nervous systems, more especially of the organic nervous system, and in the functions of the organs actuated by it. I shall, however, have hereafter to show, that the blood is the next animal constituent that becomes affected, although frequently in no very manifest manner, at first, especially when disease slowly develops itself upon the exciting causes.—It should not be overlooked, in our researches on this subject, that agents which especially affect or depress the organic nervous influence, produce also co-ordinate effects upon the vascular system and on the blood itself, owing to the intimate connection subsisting between these two systems.—*b.* In cases where the morbid impression has been already made, either by malarial, or by infectious effluvia, the full development of the disease may be prevented during the first or second stage, by substances which produce a powerful restorative or tonic action on the nervous systems, particularly that of organic life,—an effect that could not result if the blood were the primary or principal seat of the disease. A powerful stimulant or tonic will instantly cut short an ague, even when given at the commencement of the cold stage,—an effect that would vainly be looked for, if its chief seat were in the blood.—*c.* The phenomena and progress of

the causes in which it arose, and the suddenness and manner of its occurrence, as well as from various other circumstances, that it does not consist of lesion of structure, we are therefore compelled to adopt the former alternative, and, from the kind of disorder, to infer the manner in which the influence actuating the organ is affected. Thus, observing that respiration, circulation, secretion, and animal heat are primarily and especially disordered at the commencement of fever, and that various other morbid phenomena are consequently produced, and finding no structural or local change to account for the affection, we refer it to the state of the influence which actuates these functions. Anatomical and physiological evidence concur in showing that the nervous system of organic life is chiefly concerned in the production of those functions; and therefore it may be inferred that this system is first impressed by the causes of the disease.

96. But it is not merely requisite to show the particular system first affected, but also to ascertain, as nearly as possible, the *nature* of the affection. This, however, can be only a matter of inference from the kind of disorder manifested in the functions especially subjected to the influence of this system. What, therefore, is the general character of the disorder which these functions first evince?—1st. The respiratory actions are inadequately performed, volition being often exerted in order fully to dilate the lungs, and the changes in the blood are imperfectly produced;—2dly. The action of the heart is weakened, and the tone of the pulmonary vessels lowered, so that the circulation is languid, irregular, &c., and congestion supervenes;—3dly. Secretion and excretion are impeded or interrupted, animal temperature diminished, and all the functions indicate at first depression or suppression of the organic nervous influence. There is, however, reason to suppose that this influence may not only be *depressed*, but that it may be otherwise *altered*, according to the cause which affects it, particularly by specific infectious miasms. It is chiefly to this circumstance, that the opinions of JACKSON, FRANK, HILDENBRAND, and others, respecting the irritation excited by the material cause of fever, is to be imputed. Whether the alteration in question be called an irritation, or any thing else, is immaterial, if the term adopted convey any idea of what the change is, in most of the circumstances in which it occurs. But if by this irritation be meant a form of excitement, the term is applicable only to the state of vascular action often consequent upon, and attended by, the alteration of nervous influence, and not to the state of the influence itself. The whole that we know of the matter, from observation of the earliest phenomena, is, that the change evinces diminished power or influence of the system of nerves actuating the organic functions, and very frequently an otherwise altered or morbid state of this influence which cannot well be described, but which is variously modified in different fevers, and is generally attended by depression; these conditions still continuing in diverse grades, although vascular reaction supervenes, which, when it becomes excessive, increases them, and, in consequence, hastens on disorganisation. From this it will appear, that the exciting causes of fever first depress or otherwise alter, or both depress

and alter, the healthy influence exerted by the nervous system of organic life. That they primarily irritate or excite this system does not appear from the phenomena, unless either of these states associates itself with some other morbid condition which deflects it from its usual forms; but of this we have little proof, unless it be found in the stage of reaction. This much, however, is apparent,—that certain causes seem to depress the organic nervous influence more than others; and that some alter it more from the merely dynamic states, and impress it with a specifically morbid character.

97. But, whilst disorder of this influence is thus considered the chief and primary constituent of the morbid impression made by the causes of fever upon the economy, it may be asked, Is the impression entirely limited to this quarter? or are the cerebro-spinal influence, and the circulating fluid itself, also partially and primarily affected?—1st. As to the former of these, it may be inferred, from a consideration of the circumstance of the nerves of one of our senses being extended over the upper part of the respiratory passage—the entrance to a most important and vital organ—in order to convey, by their reports, intimations of the presence of such gases or vapours, as, if received into the lungs, would prove injurious, that the more intense causes will act in some measure upon the brain, although in a comparatively slight and evanescent manner. The lungs evidently digest the air received into them, as much as the stomach digests the food; and the entrances into both organs are guarded by two sentinels—the senses of smell and taste—taking cognizance of whatever passes into them. But in cases where injurious effects follow the ingestion of hurtful matters, is it in the stomach or in the nerves of taste that the morbid impression is to be looked for? and if it be in the former, and not in the latter, that they are to be found, no more should we infer, as heretofore, that the morbid change is first produced on the brain, and not on the nerves of the lungs, when noxious effects follow the respiration of a tainted or infectious air—recollecting always, that respiration does not mean simply the passage of air into and out of the lungs, but the actual digestion of this air by them, the important changes excited by its constituents upon the blood and upon the organic nervous influence, and those effected by this influence upon the blood, and upon the air received into the organ.

98. From various considerations and researches into the subject, in different climates, I infer, that, although the more intense causes may affect the brain, and thereby heighten and accelerate the effects upon the heart and stomach arising from the impression made upon the organic nervous system, yet their action in this quarter is evanescent; and, as I have shown (§94.), insufficient to explain the phenomena. Judging from my own sensations on having inspired an air so loaded with infectious effluvia as to be remarkably offensive to the smell, the morbid impression was first sensibly felt in the lungs themselves; numbness, weight, or oppression in the chest, was instantly felt; frequent forcible inspirations were made, and continued for long afterwards to be made, in order fully to dilate the lungs, which felt as if they were partially deprived of their resiliency; the pulse became weak, and the animal tem-

the time of their operation. But, still the more remarkable phenomena of these separate diseases proceed in a very different order, and very generally in so marked a manner, as to be easily distinguished by the close observer. The most frequently exciting causes of disorder, viz. mental distress, atmospherical vicissitudes, exposure to cold, moisture, &c., shall, according to the state of the individual at the time, produce an attack of general disease, unaccompanied by predominant affection of any particular organ; and the disorder shall commence and terminate without any complication. In a second individual, a more or less evident determination of the malady, or even inflammation, shall appear in the advanced course of the general disease, or even during convalescence. In a third, the local disorder shall be coëtaneous, and more or less co-ordinate with the general affection, or even outstrip it in violence during its course. And in a fourth person, local disease alone shall be primarily caused; on which, as it increases, and as inflammation becomes more fully developed, symptomatic fever, or the general derangement, shall supervene. These different states of diseased action follow the same cause, according to the disposition, susceptibility, or states of the system at the time. One person, according to this proposition, may have the constitutional derangement complicated with *rheumatic, catarrhal, bilious, nervous, gastric, or dysenteric* affection; the general disorder being attended from some early stage of its course, or from the commencement, by a heightened disease of a particular organ, or structure, and thereby constituting varieties of fever, which have been thus denominated and described by STOLL, DR HAEN, REIL, FRANK, HILDENBRAND, and others, and have occurred in epidemic forms on various occasions. Another person may have the nervous, the gastric, or the dysenteric characters superinduced in the progress of the disease, owing to external causes continuing in, or coming into operation; or to improper treatment: and a third may experience, in consequence of the pre-existing state of a particular organ or texture, an attack of inflammation, from a similar set of causes to those which produce idiopathic fever. If, therefore, the species of disease which arise from one class of causes are thus varied, owing to the predisposition of certain organs, or to the susceptibility of the whole system, their number must necessarily be further increased, and their characters very materially changed, when the additional influences of marshy exhalations, epidemic constitutions, or specific infections and contagions, come into operation. Diseased actions become not only more varied and extended by such additional causes, acting either singly or in conjunction, but also much more complicated and violent.

4. These inferences may be legitimately deduced, from an extensive survey of some of the circumstances connected with acute diseases. Their relation with such derangements as have obtained the appellation febrile, is still more intimate than with those which, strictly local at their commencement, induce consecutively general disorder. It is necessary, however, to the proper consideration of the pathology of fever, that due regard be paid to the nature and extent of its causes, and of modifying or determining in-

fluences, as far as they can be ascertained; and that a strict reference be had to the effects observed to follow the application of both classes of agents, under opposite or varying circumstances. It will also be requisite, while such an inquiry is being prosecuted, that none of the early and intermediate changes be omitted. Such omissions have but too often vitiated our speculations on the nature of disease, and more especially of fever; for, instead of recognising the early changes and states, particularly those which more directly arise from external agents, consecutive and gross effects only have more generally been seized upon, and assigned as the cause of disease. Let it not be supposed that inquiries, such as have just been recommended, are productive of no advantage in practice. The scientific practitioner will consider the most effectual means of preventing, controlling, or removing disordered actions, to be indicated by a most careful scrutiny into their nature and extent, and by a judicious inquiry into early aberrations from the healthy condition. He will view the primary derangements, in the relation they hold with their remote or occasional causes, on the one hand, and with consecutive or ultimate lesions on the other; and will thus trace each individual link of the chain of causation throughout.

5. If it be asked, What has the treatment of fever gained by our speculations as to its nature? I would answer, almost every thing. I will show this in a more demonstrative manner in the sequel, by adducing the opinions which have formerly been held upon the subject, with the practice to which they have led. But, independently of the practical results of the inquiry, there are other solid and not less alluring inducements which will operate on the inquisitive and well-tutored mind. An individual possessing a mind so constituted, feels a laudable zeal in examining into the nature of a class of disorders, which concerns not only the existence of a single individual, but influences also the prosperity of nations; and, who, entertaining even a moderate idea of the responsibility which the exercise of his profession involves, can enter upon its practical discharge, in respect of this class of diseases especially, without feeling some desire of extending his knowledge of their nature, in order that the course he pursues may be both rational and successful?

6. I. GENERAL VIEW OF FEVER. — Fevers are the most prevalent of all diseases, especially in some countries and localities; and their causes frequently cannot be avoided nor counteracted by human foresight or science. They are more especially prevalent among, and injurious to, the human species, as the history of epidemic, pestilential, and other fevers fully prove; and as evinced by those infectious fevers which often occur in camps, and follow the rears of armies during warfare, and which are sometimes much more destructive than the most hard-fought battles. — Epidemic fevers are not, however, confined to the human species; the causes in which they originate, and the influence which promotes their extension, frequently affecting also the lower animals, — a circumstance of importance in our speculations respecting the origin and nature of this very important class of maladies.

7. i. CHARACTERS OF FEVER. — It is impossible

attended by congestion of the vessels of the head. It is observed in other diseases; but it most constantly accompanies fever. — *g.* The appetites also are more or less affected. The appetite for food is diminished or entirely abolished. In rare cases, a craving for food has been observed in an advanced stage of fever, but not throughout its whole course. The appetite for the sex is also abolished until convalescence has commenced, when it reappears, and is sometimes one of the earliest signs of amendment. These symptoms probably depend upon the same cause — upon depressed organic nervous influence, and consequent deficiency of the secretions.

14. ii. GENERAL DESCRIPTION. — The word *Fever* is used in a double sense: it is applied — 1st, to that state of constitutional disturbance, in which the above symptoms are primary, essential, or idiopathic; and, 2dly, to the general disorder consequent upon, or symptomatic of, some local disease. In the latter, the febrile symptoms consist chiefly of increased heat and accelerated circulation; and without these the patient is said to be without fever. But when fever occurs primarily — is a disease *sui generis* — these two symptoms are seldom the most prominent, and are always associated with others, especially those already noticed, which may be much more manifest than they, and which are either altogether wanting in symptomatic fever, or not similarly associated, or only occasionally present. This distinction is necessary, particularly as respects the treatment, and should never be overlooked. Its importance will be more apparent in the sequel. I shall first describe fever as a disease *sui generis*; and next, as a symptom of inflammation, or some other disease of a particular organ or tissue.

15. IDIOPATHIC FEVER presents, during its whole progress, characteristic symptoms, not consisting merely of increased frequency of circulation and augmented heat, which are sometimes wanting in certain stages of the disease, but of other morbid phenomena that are equally important, that vary in degree and in modes of association with one another, and that superinduce other phenomena thereby giving rise to the different forms and states in which the disease occurs; — it commences with debility and lassitude, which are followed by chills or rigors; it is generally composed of several invasions or exacerbations; it implicates the whole of the vital endowments and faculties, the fluids, and the entire organisation; it is acute and dangerous in its course, with lesion of the circulation, with alteration of the animal heat and of the secretions, and with diminution of vital power; and it is versatile as to its symptoms and type, with efforts at sudden changes or crises.

16. 1st, *Fever begins with lassitude and debility, generally followed by chills or rigors.* — It originates in causes which affect the vital energies of the system, and occasion debility and lassitude as the earliest and most remarkable changes. These are generally attended by an insuperable feeling of fatigue upon the least corporeal or mental exertion by stupidity, loss of nervous and mental energy, by irritability, moroseness, or impatience, and by heaviness of the eyes. Upon these supervene various uneasy sensations; as, anxiety at the præcordia, occasioning frequent full or laboured inspirations; peculiar and general uneasiness and restlessness;

a feeling of cold, particularly along the spine, and differing from the real or usual sensation; horripilations, involuntary shudderings, and tremors or rigors. The debility giving rise to the unconquerable sense of lassitude and fatigue generally precedes the chills for some indefinite time, and accompanies them or continues after them. Chills or rigors often return and alternate with flushes, and other incipient disturbances, for a variable period.

17. 2d. *Fever is very frequently composed of several invasions or exacerbations, one paroxysm disposing to others; as in agues and remittents.* But even in continued fevers a similar circumstance very often obtains, as evinced by the evening exacerbations, and the aggravation of the symptoms on alternate days. Some writers, and more particularly HILDENBRAND, consider that, as in remittents, wherein a new invasion supervenes before the previous paroxysm had subsided, so in continued fevers, one fit runs into another. — “*Continuæ ergo febres, si non omnes, saltem pleræque, præsertim criticæ, è plurimis paroxysmis febrilibus, quorum unus alterum subintrat, compositæ sunt.*”

18. 3d. *Fever is a disease of all the vital endowments, functions and faculties, of the fluids, and of the whole organisation.* — If we trace the progress of fever, from the operation of its causes through successive changes, we shall find that the vital power, which is supreme over the physical properties and functions of our different structures is deeply affected throughout all its subordinate manifestations — as the sensibilities of the nervous systems, the irritability of involuntary and voluntary muscular fibres, the organic contractility of membranous parts. Hence proceed lesions: — (a) *Of the organic functions* — of the respiratory actions and functions, of circulation and of the circulating fluids; of secretion and excretion, of digestion, assimilation, sanguification, and nutrition; of the appetites, both natural and acquired, &c. — (b) *Of the cerebro-spinal and animal faculties* — of the functions of sense and voluntary motion, and of the powers of mind: the expression of the countenance and the attitudes are changed; the senses either perform their parts imperfectly, or the mind takes an insufficient cognisance of their reports; the attention is wavering and quickly fatigued; the intellectual powers and states are languid, feeble, or otherwise disturbed; the judgment is perverted by internal and involuntary impressions and conceptions; and ultimately all the mental endowments become exhausted and disordered, by prolonged wakefulness, or overwhelmed by a continued sopor. — (c) *Of the fluids and whole organisation* — The fluids and soft solids undergo changes in their appearances, form, and properties. The blood is evidently altered in various ways at different periods of the disease. Its serum is often at first in considerable quantity, and its crassamentum loose; but afterwards the latter generally becomes more firm or cupped; and ultimately again loose, or imperfectly separated from the serum. In many cases it is still more remarkably altered, as shown in the article BLEEDING (§ 78 et seq.) both in colour and consistence. The secretions, which are at first chiefly diminished in quantity, ultimately are changed in quality. They become more offensive, of a darker colour,

some respects a depuratory effort of nature, more especially as those evacuations generally occur through the medium of organs which eliminate hurtful materials from the circulating fluid. Hence, one of the safest modes of practice is that which keeps these salutary processes in view, avoiding whatever may prevent them, and promoting their evolution; attending at the same time to the preservation of the powers of life, and warding off danger from weakened, over-excited, or oppressed organs.

23. When we take into consideration the conservative influence of the vital energy, the salutary changes brought about by it, and the circumstance that every method of cure, or every agent, cannot act in a similar manner in all cases—and that, even during the most injudicious treatment, certain of the agents are calculated to meet the exigencies of some cases, either in supporting the powers of life, or in favouring or determining some critical evacuation—the reason will readily appear, why recovery often takes place in fever from the most opposite means, or when left entirely to nature; and we shall easily understand wherefore all do not die who are improperly treated, and how nature often not only overcomes the disease, but also the effects of injurious agents prescribed for it. Of the means which are employed in the treatment of fevers, there are not any which become more dangerous from inappropriate use, than the extreme measures frequently resorted to—namely, large depletions and active stimulants. The former may destroy, in a few hours, cases which nature or opposite measures might have preserved, and the latter may over-excite, and inflame to disorganisation, viscera which require to be unloaded, or to have their actions moderated.

24. It not infrequently, however, happens that the critical efforts are imperfect owing to exhausted vital power, or insufficient from the nature and severity of the disease, or misdirected or irregularly exerted in consequence of some controlling or determining influence; and hence they become sources of increased disorder, or superinduce structural change. Such results are sometimes favoured by over-active, inefficient, or inappropriate means of cure; and very often by organic lesions having taken place in so great a degree, and so early in the disease, that the salutary efforts attempted cannot subdue them, but merely tend in some instances to their aggravation and danger.

25. The event in fevers is directly produced by critical changes, and indirectly by the assistance of art: it is *favourable*, if the powers of life remain unsubdued and act without obstruction; it is *unfavourable*, if they languish or are overwhelmed. So much are we indebted to the conservative efforts of life exerted throughout the frame in the cure of fevers, that more is often to be ascribed to this source than to the interference of art; and I may add in the words of Professor HILDBRAND, “Inde enim pendet, quod miseri ac inepti medici famam, quam buccis inflatis non accipere, sed verecundi naturæ magistræ reddere deberent, in febribus sanandis sibi conficiunt. Inde pendet quod omnis sectæ medici, ac oppositarum medendi rationum adsectæ, de felici eventu in febrium tractatione gloriantur. Inde demum pendet, quod quævis theoriarum ad febres curandas applicata,

sanatorum ægrorum practica exempla offerre valeat.” (Vol. i. p. 53.)

26. SYMPTOMATIC FEVER. — Fever may be a concomitant or an effect of another disease, which would still remain were it possible to remove the attendant fever; but which being removed, the concomitant fever would cease. In as far as it consists of accelerated circulation, fever may be associated with the majority of diseases; but it is still merely a single symptom, wherefore other phenomena should be present before even symptomatic fever ought to be said to exist. Whatever irritates or stimulates the circulating system to a stronger or more frequent action, or inflames a particular part, is productive of symptomatic fever. Its cause exists within the frame, and more rarely it acts from without; as irritation or inflammation of particular tissues; the presence of foreign bodies, or of calculi, worms, or hurtful ingesta; the absorption of hurtful or acrid matters, or of contaminating secretions; surgical operations, external injuries, and violent exertion. Fever proceeding from these sources has been termed *inflammatory*, *irritative*, *fever from irritation*, *fever of the vascular system*, *symptomatic inflammatory fever*, *symptomatic fever*, *chronic fever*, *hectic fever*, according to the peculiar irritation, or local disease, on which it attends.

27. Fever is associated with other diseases in a twofold manner:—1st. *Essentially*, forming what are called *febrile diseases* or *symptomatic fevers* strictly speaking; as in *tuberculosis*, in which it is merely a symptom, but one which is uniformly present. 2d. *Accidentally* or *contingently*, not naturally and constantly, but merely from the association of some occasional disturbance or complication, as in *amenorrhœa*, *chlorosis*, *dropsy*, *rheumatism*, &c.; or as a consequence of treatment. In symptomatic fevers, the constitutional affection is neither so severe, nor so generally and equally extended to all the functions, nor so entirely implicates the fluids and soft solids, as in idiopathic fever. Hence they are more readily traced to their origin—to the irritation in which they arise. The functions which chiefly manifest disturbance in their progress are those of circulation and secretion—the latter often very slightly. Others are also occasionally disturbed, as those of the skin and of the nervous system, but generally in an indirect and slight manner. Consequently the chief characters of symptomatic fevers are quickened pulse, heat of skin, disorder of its transpiration, and thirst. The excretions, muscular power, and the faculties of mind, are but little altered. The pulse retains greater tone and sharpness, and the general surface more animation than in idiopathic fever. The external physiognomy, the posture, the extreme prostration of muscular power, the profound alterations of the vital endowments of the fluids and of the organisation itself, characterising the latter, are either altogether absent, or present in a very slight degree merely, unless when morbid matters are conveyed into the circulation during the course of certain symptomatic fevers, and thereby vitiate both it and the soft solids, disordering also the different secretions and excretions. Such occurrences sometimes take place, and have fallen repeatedly under my observation, particularly when inflammation attacks the internal surface of

and 1828, and in my lectures delivered from 1823 to 1827, particular notice was directed to the subject, and these symptoms were described as constituting a most important stage of the disease, inasmuch as in it the nature of fever would be most advantageously studied, and either its subsequent course remarkably meliorated, or its further progress prevented, by appropriate and energetic treatment. (*Lond. Med. Repos.* vol. xviii. p. 238.; and other *Refer. in Bibliog.*)

34. The phenomena described above, as characteristic of idiopathic fever, never proceed immediately from the remote causes. The impression made by them occasions a succession of changes before those which really constitute fever supervene. These early changes, being productive of those which constitute the developed disease, may aptly be called *formative*; and the symptoms by which they are indicated, *precursory*. The exciting causes of fever seem to act primarily upon the nervous system of organic life, thereby producing changes in the vital manifestations of the frame, which gradually increase until they arrive at a certain pitch, and terminate in one of the modes hereafter to be noticed. The more intense the exciting causes, the predisposition being equal, the shorter will be the duration of this period, and the sooner will the lesions constituting fever be brought about (§ 15.).—(a) The earliest effect which is made manifest after exposure to the more energetic causes of fever, as infectious effluvia or noxious exhalations, is a feeling of constriction or oppression in the chest or at the præcordia, attended by frequent sighing, gaping, forced and lengthened inspirations, and by a sense of uneasy depression, or nausea, evincing the morbid impression made upon the nervous system through the respiratory organs. The pulse is weak, slow, irregular, sometimes remittent or reduplicating, and readily accelerated by slight exertion.—(b) The natural and acquired appetites and desires are diminished; nausea is readily excited by food; and the bowels are either costive or easily acted upon by purgatives; *Venus silet*, and all the *organic functions* are impaired.—(c) The patient feels debilitated and fatigued; complains of headach, vertigo, or confusion of ideas; is morose, low-spirited, sluggish, indolent, or incapable of exertion and of directing his attention long to any object; he readily perspires, and his breathing becomes short and quick, on the least exertion; his sleep is unsound and unrefreshing, and he awakens with a sense of lassitude or with pains in his back and limbs,—in short, all the *cerebro-spinal functions* are weakened or disordered.—(d) The external expression and appearance are somewhat altered. The countenance and skin are unusually pale, sallow, or unhealthy; more rarely red. The eyes are languid, and deficient in brilliancy. The breath is fœtid or cool; and the tongue often loaded. The urine is sometimes pale and copious; and the cutaneous surface dry, cool, and harsh. These symptoms vary in severity, and often are so slight as to escape particular attention. They frequently are insufficient to induce the patient to confine himself.—(e) The duration of this stage is various in different fevers—from twenty-four hours, as in plague and some cases of typhus, to several weeks, as in ague; but it is generally from three

to fourteen days. The severer and the shorter this period is, the more acute and the more rapid will be the subsequent progress of the disease, and *vice versâ*: there are, however, exceptions to this. Fever may be cut short in this stage by active and judicious means; but not afterwards, unless occasionally in slight cases.—(f) The *pathological conditions* characterising this stage, are, depression of vital power throughout the frame, with slight internal congestion, particularly of the lungs, liver, &c.; with imperfect change of the blood in the lungs, and with diminished secretion and excretion.

35. *B. Stage of Invasion; Principium vel Initium Febris*, Auct. var.—(a) *The cold stage*, of writers—is attended by debility, lassitude, painful uneasiness, or sinking at the epigastrium, a sensation resembling cold running down the back, with formication or chills extending over the limbs and general surface. The pulse is constricted, small, weak, or accelerated; the respiration is slow, irregular, or suspicious, and attended by anxiety at the præcordia, and occasionally by a slight dry cough. On these supervene gaping, sighing, pandiculation; a sense of weight, pain, or constriction in the head; giddiness, moroseness, depression of spirits, and disorder of the senses; lividity of the lips and nails; pallor of the skin; the cutis asserina, and shudderings, rigors, or shiverings, followed by or alternating with irregular flushes. After the rigors cease, a sense of chilliness often continues for some time, although the skin has become hot. These symptoms present various grades and modifications in the different types of fever: in some the feeling of cold is actually attended by reduction of the temperature; and in others the heat is not materially, if at all, diminished, or it is even increased. The former is most commonly seen in the cold stage of periodic fevers, the latter in the invasion of continued fevers. In all, however, the cutaneous transpiration is altogether arrested, and the skin is harsh and dry. The pulmonary exhalation is also diminished, and the breath is cold. Copious discharges of pale urine often take place, evidently arising out of the arrest of the exhalation from the skin and lungs. Loss of the appetites, costiveness, thirst, and occasionally sickness and vomiting, are likewise present.—(b) The duration of this period may be very short; or it may be for many hours, alternating with slight flushes. The shorter and more intense it is, and the severer the rigors, the shorter and severer will be the consequent vascular reaction, and the more nearly approaching the inflammatory type; and the longer its duration, the more prolonged will be the fever. The imperfect evolution of this stage, or its slight occurrence, particularly when it is not attended by rigors, very generally indicates a severe malignant or typhoid state of disease. In some of the most dangerous cases of fever, I have seen this stage so slight, as to be confounded with the preceding one. This period having supervened, the disease cannot readily be cut short by bloodletting, emetics, &c.; although in the slighter cases, and more inflammatory type, these means have succeeded in some instances.—(c) The *pathological states* of the first period are increased in this, particularly the general depression of vital endowment; the impeded functions of the lungs,

evening exacerbation, whilst, in others, exacerbations are very manifest; but this depends much upon the prevailing epidemic constitution. In general, fever caused by infection, and complicated with serious visceral disease, or characterised by severe affection of the fluids and soft solids, is strictly continued; whilst that produced by terrestrial emanations assumes somewhat of the remittent form, although presenting much of the continued type.—(c) The *duration* of this state of vascular reaction is shortest in agues, in which it does not exceed a very few hours; and, in continued fevers, it is brief in proportion to the severity of the disease. It rarely, even in the more protracted cases, exceeds fourteen days.—(d) The *pathological states* of the early part of this stage continue in great measure in this part of it; but vascular action exceeds vital power, which is gradually lowered; and the circulating and secreted fluids and the solids themselves become vitiated as already stated, and as will be more particularly shown in the sequel.

40. *D. The period of Crisis — Stadium Criseos — Judicium Febris.*—Crisis in fevers is a sudden change taking place at a particular period of the disease, and terminating it. A crisis is brought about chiefly by the efforts of nature, or, in other words, by the febrile action itself inducing changes in the functions and organs, productive of a salutary effect. Although it often takes place by the unaided efforts of life, it is frequently assisted by art, and should not therefore be preferred before art judiciously employed. The *critical days* are the 2d, 3d, 4th, and 5th (quotidian period); the 7th, 9th, and 11th (the tertian period); the 14th, 17th, and 20th (the quartan period). After the 20th, crises are obscure, and seldom occur till the 27th or 28th. Salutary changes are observed chiefly on the above, unfavourable changes on the intervening days; but death may happen on any day. A very cold climate or season, or either extreme of temperature, the impure air of an hospital, the continued operation of the causes, the complications, great vitiation of the fluids and solids, an active treatment, interfere with, retard, or prevent crises. If the exacerbations be well marked, and vital energy not very much reduced, a favourable crisis may be more confidently expected. Crises are sometimes *indecisive*, or consist of several abortive attempts before the end is attained, especially when the powers of life are much lowered. When several critical efforts are required, each succeeding one renders the task more easy for the next, until the disease is gradually subdued. (See CRISIS, and Critical Evacuations.)

41. *E. Period of Decline — Decrementum — Declinatio.*—Sometimes the decline is prompt and rapid, especially after a marked crisis (see art. CRISIS); at other times it is gradual and slow, particularly when only slight and imperfect crises have occurred, or when the disease terminates in resolution without any very manifest critical evacuation. In the former case, the decline passes quickly into convalescence; in the latter, this stage is often characterised by slight exacerbations, called by some writers posthumous crises, which are apt to be misunderstood. In the fevers of this country, which frequently decline gradually, or in the second of these modes, the symptoms indicative of vital disturbance ge-

nerally subside in the order in which they appeared. Organic nervous influence and the dependent functions are the first to be restored; the respiratory, secreting, and excreting actions become natural; the perspiration more general, free, and, if it have previously been offensive, clammy, or partial, more natural and genial; the tongue begins to clean on the sides and point, and is more moistened by the commencing return of the secretions poured into the mouth; coma and delirium subside; and the patient regains his power over the alvine excretions, if it has been lost; the sensorial faculties and sleep reappear, and the latter becomes more refreshing; the locomotive powers are freer and more energetic, the patient being enabled to turn upon his side, the sense of soreness and lassitude being diminished; the appetites and desires return, and the excretions are gradually re-established. The action of the heart is the last to subside to its natural frequency, and generally continues long afterwards to be readily excited by slight stimuli. The urine is abundant, and deposits a copious sediment; the bowels become free, the motions consistent and seculent, and the skin gradually assumes a clear and healthy appearance; but emaciation increases rapidly, or now is more apparent; absorption, more especially of the less animalised and less highly organised parts or molecules, proceeding rapidly as soon as vascular reaction subsides.

42. *F. Convalescence — Stadium Refectionis — Convalescentia.*—I agree with RICHTER and HILDENBRAND in considering this as a stage of fever. The propriety of this view is obvious, especially as regards the future health of the patient. It is, however, altogether distinct from the *malady*, inasmuch as it does not present any of the constituent phenomena, which still continued to exist in the stage of decline, but merely those of debility consequent upon acute disease. During its early progress, the bulk of the body still continues to diminish, or does not increase until it is far advanced; all the symptoms entirely disappear; the appetites, desires, digestive functions, the secretions and excretions, are re-established, but are apt to be disordered, and therefore require supervision; the cuticle and sometimes the nails are exfoliated, and the hair falls out. Irritability and sensibility often are increased; and tinnitus aurium is sometimes troublesome; but these subside as health is restored.—*Relapses* are apt to occur in this period, especially from premature exposure or indulgences, or from disorder of the digestive organs; but they more rarely follow when fever arises from infection or from a specific contagion, though other diseases may be thereby occasioned.

43. IV. OF THE TYPES AND FORMS OF FEVER.—i. These are determined by the following circumstances:—a. By the *previous health*, the temperament, and habit of body, and vital energy of the patient;—b. By the state of the vascular system, particularly as to the existence of fulness or deficiency of blood;—c. By the *specific kind of miasm or cause* exciting fever;—d. By the prevailing epidemic constitution;—e. By other causes, predisposing, exciting, concurring, and determining; and by the intensity of their action;—f. By the *external and internal*—the *physical and moral*—influences, to which the patient is subjected, from the period at which

without any critical discharge. This is the most frequent mode observed in the fevers of this climate; and results, in a great measure, from the treatment adopted for them, particularly in their early stages, which generally interferes with, or prevents the occurrence of, the natural evacuations constituting *crises* (see this article). It is chiefly when artificial evacuations have not been pushed far, that crises manifest themselves.

47. *B. Terminations in other diseases* are owing — *a.* to previous disease, or the condition of particular viscera at the time of attack; — *b.* to the severity and concurrence of the causes, and the intensity of the disease; — *c.* to local determinations supervening during the progress of fever, giving rise to complications; — *d.* to improper treatment, as a too heating regimen, the continued use of cathartics, or the adoption of such as are too irritating; — *e.* to incomplete or imperfect crises; — *f.* to the too early or too liberal use of stimulants or tonics during the disease, or during convalescence; — *g.* to the continued operation of the causes during treatment; — *h.* to the occurrence of new, determining, or superadded causes, as crowding of the sick, bad ventilation, mental perturbations, in the progress of the malady; — and, *i.* to neglect, and to a blind confidence in the efforts of life. *The diseases* which may be thus superinduced, are — *a.* inflammations of particular organs; — *β.* engorgements, obstructions, and enlargements of glandular viscera, particularly the spleen or liver; — *γ.* effusion of serous fluids into shut cavities, as into the peritoneal and pleural sacs; — *δ.* partial or general anasarca; — *ε.* ulceration or abrasion of mucous surfaces — chronic diarrhoea and dysentery; — *ζ.* hæmorrhage from mucous membranes; — *η.* inflammation of some part of the vascular system; — *θ.* apoplectic, paralytic, or epileptic seizures; — *ι.* mania and insanity in some one of its forms.

48. *C. A termination in death* is favoured — *a.* by constitutional vice, excessive vascular fullness, and a bad habit of body; — *b.* by the intensity of the cause and of the disease; — *c.* by the continued operation of the chief causes; — *d.* by the nature of the complication; — *e.* by neglect or improper treatment; — *f.* by unfavourable crises; — and, *h.* by the other circumstances just mentioned (§ 47.) as productive of consecutive diseases. — This result cannot be imputed to any single change. Two or even more of the following are evidently concerned in its production: — *a.* Extreme suppression of organic, nervous, or vital power; — *β.* Lesions of organs arresting their functions, and impeding those actions necessary to continuance of life; — *γ.* Vitiation of the fluids, changing the condition of, or destroying, nervous influence and the rest of the vital manifestations; — *δ.* Exhaustion of vital power, and alterations of the intimate organisation of the viscera, as in malignant fevers; — *ε.* Organic injury sustained by the nervous system, especially its larger masses; — *ζ.* Diminished or exhausted irritability of the heart, the patient expiring as in fatal syncope; — *η.* Suffocation from effusion into the bronchi; — *θ.* Congestion of the lungs, heart, and large vessels, to an extent beyond the vital power of these parts to overcome; — and, *ι.* Deficiency of blood so considerable as to destroy the relative conditions of the contained fluid and

containing vessels; for when the tonicity, the organic contractility, of the latter is much impaired, as in the advanced stages of adynamic fevers, and the amount of circulating fluid is also greatly lessened, the vessels will be unable to accommodate themselves to their contents, and the consequences must necessarily be most dangerous, if not speedily fatal.

49. VI. OF THE APPEARANCES AFTER DEATH.

— *A.* — *a.* Cases have been met with, wherein the most careful examination has failed to detect any lesion, or strictly morbid appearance, in any of the general systems, or individual textures, or in the fluids contained in the large vessels. It must be admitted, therefore, that changes may take place in the nervous system, or in the blood, sufficient to cause the most acute disease, or even to subvert life, without being so gross as to be demonstrable to our senses; but allowing this, the fact now stated is important, inasmuch as it most materially affects the question as to the nature of fever. — *b.* Other cases have been observed — and much more frequently than the foregoing — in which the morbid appearances were not commensurate with the intensity of the symptoms referrible to their seats, and were quite insufficient to account for a fatal issue. — *c.* Frequently also, lesions of parts have been discovered, which were not indicated by symptoms, or by the usual symptoms, or very slightly and imperfectly; those changes having been more or less, or even entirely, latent during life, although their nature evinced their existence and progress during the advanced stages of the disease. This circumstance may have arisen from an oppressed or exhausted state of the brain; or from the changes in the circulating fluid impairing sensibility; or, as Dr. ALISON suggests, in his very able and lucid exposition of the Pathology of Fever, from an enfeebled state of the circulation at the time when these local affections take place.

50. *B. As to the nature of the changes observed,* opinions are somewhat different. — Many writers have viewed them as purely inflammatory; others as consequences of irritation, or of inflammatory irritation; this condition being viewed by them as a lesser grade or modification of inflammation. It is important to entertain precise ideas as to their nature; and to mark the circumstances in which they differ from those changes indisputably resulting from pure inflammation, particularly as occurring in a previously healthy constitution. — 1st. The lesions observed in fevers rarely present effusions of lymph or pus, especially in the adynamic and typhoid fevers, — consequences commonly following true inflammation; and the cases in which these effusions have been detected, have been instances of local inflammation supervening in the course of the more sthenic or inflammatory forms of fever. — 2dly. The lesions or inflammatory appearances have been more superficial, diffused, and attended with a darker discolouration, and greater softening of the affected and adjoining parts, than in idiopathic inflammation. — 3dly. The appearances thus characterised, differ the more from inflammation, the lower the type of fever and the more vitiated the circulating fluids. — 4thly. They more nearly resemble erysipelatous inflammation, than any other. — 5thly. They are met with in certain tissues more frequently than in others; and, excepting deficient

signs and tendency of these changes, as well as the reputation of the physician. — It is often difficult, owing to the mutability of the disease, and to the liability to err in appreciating those signs by which changes of the functions and of the organisation are indicated, particularly when the chief manifestations of life, and sensibility and organic contractility, are more or less impaired or perverted during the course of fever. The prognosis depends, generally, upon the following circumstances: — *a.* The nature and intensity of the predisposing, exciting, and concurring causes; — *b.* The character of the prevailing epidemic, or epidemic constitution; — *c.* The type, form, and state of the disease; — *d.* The states of the various functions, and of nervous and vital energy; — *e.* The congruity of the symptoms, and various contingent phenomena; — *f.* The influences, treatment, and regimen to which the patient is subjected; — and, *g.* The *entical* or other changes which may take place.

58. *A.* — *a.* The *predisposition* caused by debility, acute sensibility, or a plethoric and cachectic habit of body; a previously morbid, or congested state of the internal viscera, particularly of the liver, bowels, and spleen; and advanced age; increase the danger from fever. Some *epidemics*, however, most frequently attack the young and robust, and prove even more fatal to them. But, although *sporadic fever* may be also common in this class of patients, it is less dangerous in them than in the foregoing. — *b.* The *exciting agents*, particularly specific animal miasms; their concentrated form; the concurrence of several causes, either contemporaneously or in quick succession; their prolonged action, or continuance during the disease; and certain of the circumstances, inducing unfavourable terminations (§ 48.); render the prognosis much more serious. Some importance should also be attached to the character of the prevailing epidemic, as respects its open or insidious form, and the effects following a treatment appropriate to the usual states of the disease.

59. *B.* — *a.* The *intermittent type* is less serious than the remittent, and this latter than the continued; but the more the fever is inclined to change, to become irregular, or to pass into one of a graver character, the more serious it is. The more complete the intermission, or the remission, so much less is the danger; and the more disposed continued fevers are to evince a remitting form, the more favourable is the circumstance. The longer fever has continued, the more difficult will be the cure; and relapses are more unfavourable than first attacks. — *b.* The inflammatory and *athenic species* are much more generally favourable than the *adynamic forms*. — *c.* The *simpler* the fever, the more certainly will recovery take place; and the more *complicated*, the greater is the danger. The *adynamic form*, with *predominant affection*, of an important internal organ, especially the intestinal mucous surface, or the brain, or the lungs, is accordingly amongst the most dangerous; more especially if the vascular system and circulating fluids, or the soft solids, also become vitiated.

60. *C.* The *more that the organic nervous influence* is suppressed, diminished, or disordered throughout the different viscera, the more unfavourable should be the prognosis; the functions of

the viscera, the state of the fluids and secretions, and the appearance of the soft solids, evincing the extent of the disorder and of the danger. — A weak, small, and quick pulse; a dark, dry, and contracted tongue; profuse, offensive, viscid, and unnatural perspirations; watery, foetid, flaky, membraniform, and unhealthy stools; discoloured, scanty, and brown urine; livid or discoloured nails, fingers, eyelids, lips, and nose, independently of the cold stage; a discoloured, dark, and dry mouth and throat; and an offensive and penetrating odour proceeding from the patient; — are dangerous symptoms. A pulse of 120 or upwards, unless in the puerperal state, is unfavourable, and so much the more so as it is above this number. A brown or black coating, and deep, reddish fissures, or a dark or livid colour of the tongue; stridor of the teeth; a movement of the lips and lower jaw as if eating; firm closure of the jaws and lips; extreme anxiety at the *præcordia*; tumefaction, tenderness, or pain of the epigastrium, hypochondria, or abdomen generally; tympanitic or flatulent distension of the abdomen; copious or repeated discharges of blood by stool; a sudden irruption of the catamenia, and an equally sudden disappearance of them; a moaning, weak, quick, abdominal, or gasping respiration; coldness or rawness of the expired air; hiccup; excessive increase, or diminution, or irregular distribution, and otherwise morbid state, of the animal heat; sunk features; rapid emaciation; great difficulty or impossibility of acting upon the skin by sinapisms or blisters; an earthy, or deadened, unnatural, lurid appearance of the external surface; yellowishness of, or petechiæ and livid or purple blotches on, the skin; and dark mucous sordes on the lips or gums, or sanious discharges from the latter or from the nose; — are very unfavourable circumstances.

61. *D.* The unfavourable symptoms, more directly depending upon the *cerebro-spinal nervous system*, are, — *a.* extreme pain of the head; excessive sensibility or depression of spirits; tamed or red countenance, injected watery eyes, contracted brows, &c., quickly passing into delirium, sopor, or coma; prolonged watchfulness, or early somnolency or torpor; convulsive movements, trismus or spasms of parts, great restlessness, and continued tossings; despair of recovery; and a presentiment or feeling that death will ensue: — *b.* And still more unfavourable are, early mental indifference, particularly to the issue of the disease; insensibility or sopor; profound coma, and difficulty of being roused; relaxation of the sphincters, and unconscious evacuations; excessive loss of muscular power; inability to retain any other than the supine posture, especially early in the disease, and in connection with extreme pain in the back and loins; falling down towards the foot of the bed; a position of the limbs and body, depending upon their gravity, and different from that usually preferred by the patient; inability to assume a posture different from that in which he is placed; picking with the fingers at the bed-clothes; subultus of the tendons; catching after objects in the air; alternate dilatations and contractions of the nostrils during respiration; loss of voice or speech; trembling of the tongue, or inability to protrude it; an open mouth or relaxation of the lower jaw; difficulty of deglutition; and dilatation and insensibility of the pupil.

tage will accrue from opening the temporal artery or jugular vein, above that derived from bleeding from the arm; and even this will not be frequently requisite; the more especially as an equal or even greater benefit, at a less waste of blood, will result from cupping largely on the nape or over the mastoid processes, or from leeches in the latter situation and occiput. Both bleeding and the cold affusion on the head may be carried to an injurious length, especially if it be attempted to remove, or materially to benefit, within an inadequately short time, this complication; many of the phenomena of which are dependent upon, and inseparable from, the fever, and to be removed only with it. Let not, therefore, this or any other treatment be mischievously persisted in, with the mistaken view that it can accomplish what the nature of the disease renders impossible; but at the same time, let it not be insufficiently employed. Purgatives, especially those with calomel, with James's powder, or other antimonials, should follow early depletions, particularly if this complication occurs early in the fever; and at later periods the calomel may be given with opium, every four or six hours, the bowels freely opened, and derivatives applied to the insides of the thighs or calves of the legs. As to the treatment of COMA and DELIRIUM in fever, it is unnecessary to add any thing to what I have advanced in those articles, and at other places in this. It should, however, be recollected, that other complications may coexist with predominant cerebral affection, particularly in adynamic fevers; and if this affection be very severe, or consist of delirium or coma, and more especially if it depend upon a morbid state of the blood, these complications may be thereby masked, and proceed to a fatal height before they are detected. This we have seen to be the case as respects the lungs and intestines, and it is not less so as regards the liver and spleen. Nor should the readiness with which sphacelation occurs, either from the pressure of the body, or from excoriating discharges, and inattention to cleanliness, and to the preservation of a dry state of the linen, or from blisters or injuries, be overlooked; for an early inquiry after the first indications of this occurrence will often prevent much trouble, suffering, and danger.

166. *F.* The regimen and management of patients in fever are much more essential to recovery than is sometimes supposed. Not only are the purity, dryness, and rapid renewal of the air deserving of attention, but also its temperature, which ought to be regulated, as well as the quantity of the bed-clothes, according to the states of vascular action and vital power. The patient should be screened from too free a current, particularly of cool air, and especially in fevers of low excitement, as the pulmonary and, indeed, other complications may be induced by this circumstance. When excitement is fully developed, the air should be cool, and the clothes light; but in other conditions, especially when the temperature of the body does not rise above natural or is depressed below it, proportionately increased warmth is necessary, in respect of both the air and the quantity of bed-clothes. The room also should be darkened, all noise excluded, and mental excitement or irritation carefully avoided. The mouth and gums ought to be

washed from time to time, and the linen changed very frequently; the surface of the body being sponged with simple or medicated water, of a temperature in relation to the forms of fever, as stated above (§ 140.). All the evacuations ought to be passed in the bed-pan without leaving the supine posture; and if they take place involuntarily or unconsciously, oiled silk should be placed next the bed, and folded sheets underneath the patient. Care must be taken that retention of urine or over-distension of the bladder does not occur, without being detected at once and remedied. The accounts of the nurse must not be trusted to in this, more than in other matters, but the state of the abdomen above the pubes carefully examined. If pressure cause excoriations, or threaten sloughing, measures should be immediately taken to prevent further mischief. The part may be washed, as Dr. GRAVES advises, with a solution of ten to fifteen grains of nitrate of silver in an ounce of water, or with a weak solution of the super-acetate of lead in spirits of turpentine; or with this latter and dilute pyroligneous acid; or it may be covered by defensive plasters. If sloughing occur, carrot poultices copiously sprinkled with the chlorates, particularly of lime, or with spirits of turpentine, or with kréosote, must be employed; or poultices with bark, to which either of these may be added; and pressure removed from the part and its immediate vicinity by air-pillows, or by the use of Dr. ANNOTT's hydrostatic bed. But these unpleasant occurrences should be prevented, where the appearance of the soft solids and the prostration of the patient indicate a disposition to them, by having early recourse to these latter means, and by supporting vital power by the means appropriate to existing pathological states.

167. *G.* The food and drink in fevers should be varied with the existing states of vascular action and power. In periodic fevers, light food may be allowed in proportion as the apyrexial period is complete. But in continued fevers, particularly during the early stages, and whilst excitement continues, no food beyond thin water gruel, fresh whey, and orangeade or lemonade, should be given. The best drinks during excitement are those prescribed in the APPENDIX (F. 592. et seq.), or any of the mineral acids in sugared water, and flavoured by lemon peel, or weak black tea, according as they may be congruous with the medicines prescribed internally. Thus, care should be taken not to allow the patient any of the mineral acids, when calomel, or any of the other preparations of mercury, is being taken. But when vascular reaction is low or imperfect, and vital power considerably depressed, or when the pulse is very rapid, tumultuous, and soft, Seltzer or soda water with old wine, hock, or weak punch, or wine whey, spruce beer, brisk bottled stout or brisk bottled beer, &c., according to the peculiarities of the case and the previous habits of the patient, may be allowed. If coma be present, green tea is one of the best beverages that can be allowed, and if the powers of life be very depressed, it may be made into a weak punch; the patient also being often roused by talking to him on lively interesting topics. He may be allowed oranges, grapes, or lemons sweetened with sugar, particularly when the mouth is foul and dry; but care should be taken that neither the pulp nor the stones are

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Those who wish a further reference to the subject may consult also the collections of *BONET*, *MANGET*, and *PLoucquet*, where comparatively few of the above words will be found, in this case, as in every other throughout the work.

XI. INTERMITTENT FEVER. SYN.—*Διαλείπων*:

εμψροί, Hippocrates and Galen; *Ασθμα*, Young and Good; *Kalte Fieber*, *wechselläufig*, Germ.; *Paludal Fever*, *Periodic Fever*, *Ague*, 171. DEFIN.—*The febrile phenomena running their course rapidly, observing a certain succession, usually terminating in crises, and returning after regular apyrexial intervals.*

172. Intermittents have been divided by modern writers—into the quotidian, tertian, quartan, &c.; into vernal and autumnal,—into regular, erratic, and anomalous,—into simple, complicated, and masked (*FOURRIER, VAIDY, &c.*). But in addition to these types, which have reference merely to the intervals between the accessions of the paroxysms, agues assume certain forms or characters, which are still more important than they are, in a practical point of view. These have been variously distinguished by writers. *J. P. Frank* has arranged them into the nervous, the gastric, and inflammatory, the second and third of these, in being complicated, often assuming a remittent type. *J. Frank* has divided them into 1st, the evident, and 2nd, the masked, the former being—*a. benign*; *b. malignant*; *c. regular*, and, *d. irregular*. *M. PINEL* has classed them

many of the symptoms stated above, as indicating the *formative* period of fever (§ 33.), being present. Indeed, the interval in every respect corresponds with this period. When the ague continues some time, although it may not change its type or form, as it is then prone to do, especially in warm climates, the patient becomes weaker, loses flesh, has a sallow hue, and experiences obstructions or enlargements of the spleen, liver, mesenteric glands, &c., with a deranged state of the secretions and excretions; the disease passing into the complicated states (§ 183.), or terminating as will appear hereafter (§ 189.).

180. C. The *conversion* of one type of ague into another often occurs: tertians and quartans changing to quotidians, or to double or triple tertians and quartans, especially when they become aggravated; and quotidians into tertians when they are somewhat ameliorated. Agues, particularly quotidians, may also be converted into remittents, or even into the continued type, by the constant operation of the exciting causes, or by other powerful determining influences; but they often assume a complicated or an irregular form in the course of transition. When the fits of a quotidian, or of a double tertian, or of a triple tertian, approach each other so closely that the one is hardly finished before the next commences, the fever has been called *sub-intrans*, or *sub-intrans*; and differs but little from a remittent type, excepting that the cold and sweating stages may be somewhat more marked in the former.

181. ii. *Inflammatory Ague*.—Intermittents with more or less of inflammatory excitement have been described by SYDENHAM, PRINGLE, HUXHAM, SELLE, FIZEAU, BOISSEAU, &c. Mr. ANNESLEY and the Author have shown their frequency in warm climates, especially during the cold seasons, in elevated situations; and in persons of a previously healthy constitution. They are characterised by very severe rigors in the cold stage, followed by vomitings and intense vascular reaction; unquenchable thirst; by severe and rending headach, sometimes with delirium; by great heat and by turgescence of the countenance and of the whole surface. The reaction during the hot stage is generally attended, particularly in plethoric persons, by marked determination to, and vascular turgescence of, particular viscera, according to accessory or determining causes. The organs which thus evince a predominance of vascular action, are, the encephalon; the liver and stomach, especially in warm climates, and in autumn in cold countries; the lungs and bronchi, in some instances; and the uterine organs, in rare cases.—This form generally assumes a tertian or quotidian type; is easily removed if actively treated, owing to its common occurrence in sound constitutions; but it rapidly passes into organic change, or into the remittent or continued type, in hot climates, when neglected or improperly treated.

182. iii. *Ague with oppressed Power*, or partaking more or less of an *adynamic* character, is often met with in Europeans who have resided long in hot miasmatic countries; in debilitated persons living in low, marshy, and moist countries; and in the intemperate; but it rarely occurs in these in an uncomplicated state. Whilst vascular reaction and vital power rise above the standard presented by *simple ague*, in the *inflammatory*

form; they sink more or less below it, in the *adynamic*.—The cold stage is often attended, in this latter, by general tremblings, rather than by strong rigors; and is followed by nausea and vomiting; developing a burning or pungent heat of the skin, which is dry, and occasionally somewhat sallow. The pulse is very quick; the tongue loaded, and red at the edges; and the epigastrium tender and oppressed. This state nearly approaches the *gastric variety* of Continental writers. More frequently, however, the form commences with horripilations, seldom amounting to trembling or rigors; often with nausea and vomiting; fulness at the epigastrium, and headach. To these succeed increased heat, alternating at first with chills; a quick, oppressed, but not hard or full pulse; somnolency, and imperfectly developed and hot and sweating stages.—Thirst is not much increased; the heat is moderate; the skin is sallow, yellowish, or lurid; the urine citron coloured; and the subsequent perspiration is scanty, or offensive.—This form usually assumes a quotidian, double tertian, or triple quartan type; more rarely tertian; and sometimes erratic. It commences also irregularly, either early in the morning, or in the evening, or at night. The *intervals* are attended by more or less disorder; by an unhealthy appearance of the surface, a loaded tongue, and morbid excretions. The lower grades of ague are more frequently complicated (§ 183.) than simple; or, if the latter, they soon superinduce congestions, obstructions, and organic lesions of important viscera, most frequently of the stomach and bowels, of the spleen, liver, mesenteric glands and pancreas.

183. iv. *Complicated Ague*—*Intermittent perniciosa*, of the French—*Intermittentes comitate*, of TORTI,—the *Malignant*, of some writers—is very frequent in warm climates, and in marshy districts in the south of Europe; and is sometimes met with in parts of this country. It usually presents the preceding form as respects the states of vascular action and power, but it may assume more or less of the inflammatory character, particularly in the early paroxysms. It often has less perfect intermissions than the foregoing forms, especially after two or three paroxysms; is generally quotidian, double tertian, or triple quartan, and frequently passes into a remittent or nearly continued type, especially in Europeans who have resided long in hot countries, and in the intemperate. It appears in two ways;—*a.* primarily in a faulty constitution, or in persons with previous disorder of some important viscus,—and, *b.* as an advanced grade of either of the preceding forms. The most frequent complications are with diseases of—*a.* the digestive and biliary organs and spleen; *β.* of the thoracic viscera; *γ.* of the cerebro-spinal functions; and, *δ.* of other parts.

184. A. *With disease of the abdominal organs*, ague presents diversified symptoms, according to the viscus especially affected.—*a.* If the stomach be particularly diseased, severe, burning pain at the epigastrium, with tenderness, distension, nausea, and vomitings, which are increased by whatever is taken into the stomach; distressing flatulency; dry or red tongue; high-coloured and scanty urine; sallow or depressed countenance; yellow streaks around the mouth; imperfectly developed hot stage, with a sharp, quick, and contracted

impairing the vital energy and vascular tone of the viscera of the large cavities, especially those of the abdomen. Hence arise — 1st, the complications described above; — 2dly, remittent or continued fevers, with more or less affection of particular organs, or of the circulating and secreted fluids; — 3dly, inflammations or structural change of internal viscera, superseding the periodic seizures; — 4thly, dropsical effusions; — 5thly, chronic dysentery and diarrhoea; — and, 6thly, a fatal issue, chiefly in the cold stage, owing to insurmountable congestion of the lungs, heart, liver, and spleen, or to rupture of this latter organ.

190. The congestions of these viscera, in connection with impaired organic nervous power, more especially of the liver and spleen, give rise, by frequent repetition, to enlargements, to a torpid state of the former, and consequently to engorgements of the portal vessels and of the hepatic ducts; to imperfect secretion and assimilation of the chyle absorbed and passed into the mesenteric veins; to obstructions of the mesenteric glands; to obstructed circulation and its consequences, through the veins contributing to form the portal circulation; and ultimately to an unnatural state of the blood, and structural lesions of the digestive mucous surface, and of the large secreting and excreting glands. Hence old and complicated agues are accompanied with a sallow, sunk or bloated, and oedematous countenance; pale lips; foul, loaded tongue; yellowish, foul, or lurid skin; fulness, distension, or tenderness at the epigastrium, both hypochondria, and over the abdomen; pain and aching between or under the shoulders, and in the loins; clay-coloured, or dark, watery, offensive, and otherwise morbid stools, the bowels being more or less disordered; dark-coloured and scanty urine; great debility and dyspnoea; and a weak, irregular, and frequent pulse. If rupture of the spleen occur, acute pain is suddenly felt in the splenic region; with diffused fulness, pain, and tenderness of the abdomen; small frequent pulse, cold extremities, syncope, &c.

191. *B. Appearances in Fatal Cases.* — Death may take place either from overpowering congestions in the cold stage, or from rupture of the spleen; but it most frequently results from the superinduced disease of internal viscera, in connection with exhausted organic nervous power, and sometimes with a morbid state of the circulating fluids, particularly in the adynamic and complicated forms. The chief lesions are seated in the liver, spleen, digestive mucous surface, and lungs. — *a.* The liver is often enlarged; its consistence being either increased or diminished; tubercular or purulent formations being, moreover, dispersed through its substance. Increased consistence or density, softening, purulent or tubercular formations, &c. may also exist separately, or in various combinations. Engorgement of the vessels with dark blood; distension of the hepatic ducts and gall-bladder, with a dark or greenish black, thick, and viscid bile; thickening and injection of the ducts and gall-bladder, &c.; are often observed in connection with other lesions, but more especially with enlargement and softening of the substance of the viscus. — *b.* The spleen is often remarkably enlarged. MORAGNI and GROTANELLI found it to weigh eight pounds. In some localities, it occasionally reaches an enor-

mous size. On the Gold Coast of Africa it has been found double this weight in Europeans. I saw a case in which it was nearly eleven pounds. Its envelope sometimes presents appearances of chronic inflammation — is injected, thickened, and almost cartilaginous. Its consistence internally is rarely increased; but is most frequently diminished; its structure being friable, oftener almost diffuent, or consisting of a greyish black semisolid substance, traversed by greyish fibrous shreds or fibres, and containing a sanguineous fluid of a purplish hue, or resembling wine leek. Instances have also occurred where adhesions have formed between the spleen and stomach, and between the spleen and colon in others; and the thick black blood of this viscus has been thus discharged into the digestive canal by ulceration, the matter passed from the bowels or thrown off the stomach presenting a blackish appearance (MORILLI, GASTÉ, BAILLY). — *c.* The digestive mucous surface is, in various parts — in the ilium, the caecum, colon, stomach, duodenum, and oesophagus — more or less altered; often softened; injected with dark blood in patches or spots; and occasionally ecchymosed. The mucous follicles are frequently enlarged or inflamed in various parts. Ulceration is seldom observed, unless the disease has been complicated with diarrhoea or dysentery, and then this lesion, with thickening and softening of the coats of the bowels, especially of the caecum and large bowels, and peritoneal injection, is generally observed. — *d.* The mesenteric glands are sometimes enlarged, and present signs of obstruction or of chronic inflammation; more especially when lesions of the digestive canal are very remarkable. — *e.* The pancreas is occasionally enlarged, in some instances so as to obstruct by its pressure the common bile-duct. — *f.* The lungs are sometimes congested; but seldom otherwise changed, unless pulmonary complications have existed, when similar lesions to those described above (§ 53.) are observed. — *g.* The brain and its membranes are not often much altered, unless in the comparatively rare cases in which coma has attended the fit; or apoplexy, or convulsions, or paralysis, has occurred in it; when congestion of the pia mater, effusions of serum between the membranes, or in the ventricles, are the usual appearances. — *h.* Dropsical effusions, especially in the peritoneal cavity, and cellular tissue; a pale, flaccid, or softened state of the structure of the heart; and more or less discoloration of a yellowish, or lurid, or dirty hue; are sometimes also observed, particularly in the more adynamic or protracted cases.

192. *vii. Prognosis.* — It is evident that an opinion as to the result of an ague should depend especially upon the form and pathological condition in which it presents itself. As to these, enough has been advanced to enable the reader to form his own opinion. But in the adynamic and complicated forms especially, and in protracted cases the diagnosis should be more or less unfavourable, or at least very guarded. The circumstance, that even in more favourable states of the disease, a very dangerous complication, or structural change, may occur, ought not to be overlooked. — apoplexy, coma, paralysis, fatal congestion of abdominal or thoracic viscera, or rupture of the spleen, may supervene. The epidemic prevalence of the disease, and more particularly the influence

either pre-existing or superinduced inflammation, if it be not sufficiently intense to supersede the intermittent type, will be aggravated during the paroxysm, especially the hot stage of it.

196. *b.* From attentive observation of the disease in localities the most fertile in its cause, I conclude — (*a*) That paludal exhalations act in the manner already stated (§ 95.), and especially affect the nervous system of organic life; — (*b*) That consequently the organs, which are especially actuated by this system, experience the chief effects of the morbid action; the functions of circulation, calorification, digestion, secretion, assimilation, and excretion, evincing the principal disorder, and the organs performing these functions the chief lesions in protracted, or fatal cases, as shown by the appearances described above (§ 191.); — (*c*) That where, owing to the specialty of the exciting cause, and the intensity or continuance of its operation, its peculiar impression is fully made upon the organic nervous system, either pre-existing, or superinduced disease, inflammatory or even structural, if existing in a slight degree, or in a chronic form, will not supersede the periodic or intermittent type; but if such disease be acute or active, or associated with high irritability of fibre and vascular plethora, the type will be either continued or remittent, or change from the intermittent to either of these types; — (*d*) That a similar conversion of type will result from contamination of the circulating and secreted fluids when it reaches a considerable height; — (*e*) That in localities productive of malaria, the slighter diseases, especially those consisting chiefly of disordered function, or of altered sensibility, assume more or less of the intermittent type; only the most acute maladies, or those of altered structure, or attended by contamination of the blood, assuming a purely continued course; — (*f*) After viewing the effects of malaria arising from the various sources pointed out in the article on ENDEMIC INFLUENCES (§ 5.), on the human frame, in the various epochs of existence; after considering the nature of the agents by which such effects may be counteracted, or removed; and after the experience of the primary and consecutive action of this particular cause upon my own system; I believe that it has a primary, specific, and uniform tendency to impair the energy of all the vital manifestations; — (*g*) That the morbid impression having been made by it, and the formative changes having reached that pitch necessary to the production of the cold stage, the consecutive alterations proceed in the manner stated above (§ 101.), but much more rapidly and imperfectly, and in a way insufficient to efface the primary morbid impression made by the cause upon the organic nervous system; consequently the morbid state of this system is little affected by the successive changes characterising the paroxysm; and continuing the same after, as it was before the fit, is equally efficient in operating a return, after an interval of varying but of short duration, of the same succession of phenomena.

197. From this last inference, and from previous observations, it will appear, that each paroxysm is a complete febrile seizure, the successive and critical changes of which are insufficient in most instances for the restoration of health; that the disorder remaining after the subsidence of the fit is in every respect similar to that characterising

the formative or premonitory stage of fevers generally; and that it is necessary to the cure of the disease, that it should be treated in a nearly similar manner. This view is supported by the fact of relapses of continued fevers being common, when their duration is shortened by an active or very depletory treatment at their commencement. As to the periodicity of the return, or the relapse, of the febrile paroxysm in ague, it seems to be the consequence of the specific nature of the exciting cause, of the morbid impression made by it upon the organic nervous system; and of the continuance of this impression, or rather of the morbid state it occasions; for, as long as the morbid condition of this system is uneffaced by treatment, change of air, or by the full evolution of critical changes, it operates a return of the febrile paroxysm after an interval which may be prolonged or shortened by the state of vital power, and peculiarity of temperament or diathesis. As to any further explanation of the matter, I can add nothing to what is given in the article DISEASE (§ 155—157.).

198. *c.* The consecutive changes, and the low or complicated forms of ague, are manifest consequences of repeated seizures, or returns of the disease, in connection with predisposition, and with the intensity and continued operation of the cause. Owing to the impaired tonicity of the vessels, consequent upon depressed vital power, and to the frequent returns or severity of the cold stage, congestions, and subsequently torpor, obstruction, and organic change, of internal viscera, often take place, the large vessels becoming engorged, and the cavities of the heart itself sometimes softened, or distended and enlarged. — The changes observed in the digestive mucous surface are chiefly attributable to the same causes, and to the morbid condition of the biliary and pancreatic secretions. The low or adynamic forms are evidently results of the intensity of the cause in relation to predisposition and the state of system — of the continued operation of the cause, as when the patient cannot be removed from the locality productive of the malaria — of complications supervening in the course of the disease — and of changes in the circulating and secreted fluids.

199. *x.* TREATMENT. — Ague is treated with comparative ease and success, when the patient is removed into a pure air, and when it is neither complicated nor of a low grade. If removal is impracticable, it is often very difficult to manage, and dangerous as respects its consequences or sequelæ, although an unfavourable result may be long deferred. — The treatment, however, in either case, naturally divides itself into that applicable — *a.* to the paroxysm, — *b.* to the interval, — and, *c.* to the effects often consequent upon repeated attacks.

200. *A.* During the paroxysm. — The principal intentions that should be kept in view in the treatment of the fit, are — 1st, to guard important viscera from injurious congestions during the cold stage; 2dly, to protect internal organs from the effects of excessive or inflammatory reaction in the hot stage; and, 3dly, to promote an abundant perspiration in the sweating stage, whereby the vascular system and the internal viscera may be relieved.

201. *a.* Treatment of simple ague. — The means advised by STOLL are here generally sufficient.

nistered, and its operation promoted by diluents. If it have been given at the beginning of the fit, and acted freely, it may be dispensed with now. But it should not be administered if symptoms of determination to the brain, or of inflammatory action of the stomach, liver, or spleen, be present. After its full operation, a large dose of *calomel* — from ten to twenty grains — ought to be given; and, about four or five hours afterwards, a *purgative draught*. If these act not sufficiently in a few hours, a cathartic enema should be exhibited. Having removed local congestions or general plethora by *depletions*, and evacuated morbid secretions and faecal accumulations, *cinchona* or the *sulphate of quinine* may be exhibited, to prevent the return of the fit. These are almost indispensable preliminaries to the quinine or bark, especially in the complicated and congestive forms: for, without them, it will either not be retained on the stomach; or, if retained, will convert congestions, or slight forms of inflammatory irritation, to active inflammation, or to structural change.

207. *b.* If the stomach remain irritable after the fit; or if pain or tenderness at the epigastrium, with other symptoms of inflammatory irritation or congestion, be present; the full dose of *calomel*, either alone or with opium, ought not to be withheld; for, as Mr. ANNESLEY has shown by his instructive experiments (*Sketches of the Diseases of India*, &c. 2d ed. p. 374.), this remedy has the effect, in large doses, of diminishing vascular action in the stomach and in the upper portions of the intestinal canal. When prescribed after depletions, general or local, and the external measures described above (§ 203.), the internal disorder will be removed, and the quinine, which is almost indispensable to the arrest of the disease, will be retained without uneasiness. If *quinine*, especially its *sulphate*, cannot be procured, the *bark* in substance, in large doses, must be substituted; and conjoined with ammonia, or camphor, capsicum, or opium, &c. shortly before the expected accession of the paroxysm. The decoction with *serpentaria*, the extract, or the compound tincture, may likewise be employed, but chiefly as an adjuvant. In every state of the disease, during the exhibition of quinine or bark, the excretions demand attention: a full dose of *calomel*, especially in warm countries, ought to be given from time to time, and followed by active purgatives and enemata. If the alvine excretions, and the biliary and other secretions, be not freely promoted during the exhibition of bark or quinine, great risk of superinducing inflammation, congestion, obstruction, and enlargement of the abdominal viscera, or violent determination to the head, will be incurred.

208. *c.* If the disease have been of long standing, congestion, obstruction, or enlargement, or chronic inflammatory action in some abdominal organ, has probably taken place. In these, the immediate use of *bark* or of quinine will be of doubtful efficacy. The treatment should, therefore, be commenced with sufficient local depletions, followed by the external means already noticed (§ 203.), and by the repeated exhibition of purgatives, a full dose of *calomel* having been premised and given again at bed-time, as circumstances may require. This treatment is especially indicated in those more severe cases in which the intermissions are imperfect, the tongue much loaded, and fulness, distension, or uneasiness in

the upper regions of the abdomen, are complained of. Morbid secretions and local disorder being removed by these means, the *sulphate of quinine* or bark should be prescribed, at first either with purgatives, or alternately with those which will act decidedly. It is chiefly to a neglect of this practice that complications and unfavourable consequences so often follow the use of bark, quinine, or of arsenic; for these often interrupt excretion, and over-excite and inflame loaded, obstructed, or congested organs.

209. *d.* When the patient cannot be removed from the continued influence of malaria during the treatment, we must nevertheless trust to the energetic employment of the above means; thereby removing morbid secretions, improving the secreting and excreting functions, subduing local disease, and making a powerful tonic impression upon the organic nervous system and digestive organs. With this last view, the doses of quinine or bark should be as large as the stomach will bear, and exhibited shortly before the expected return of the paroxysm, or immediately after the sweating stage, when the intermissions are short or incomplete. Its effects will often be promoted, and it will not so readily offend the stomach, if it be given with camphor, opium, capsicum, pepper, cinnamon, &c. according to the peculiarities of the case. In these circumstances, as well as when the disease presents an adynamic form, or is more or less complicated, especially when the tongue is much loaded, or flabby and pale, the paroxysms prolonged, and the intermissions imperfect, *calomel* in full doses, at bed-time, either alone, or with James's powder or opium; a warm stomachic purgative the following morning (F. 216. 266.), thereby procuring three or four evacuations daily, and the quinine alone, or combined in the manner just stated, during the intermissions, or until the accession of the cold stage; are most to be depended upon. If the spleen be much enlarged, and the patient subjected to the enervating influence of malaria, *calomel* must be given with greater caution, and its effects watched. In such circumstances, the purgatives selected should be prescribed with a tonic; as the *sulphate of quinine* with the *sulphate of magnesia*; the decoction of bark with the *sulphate of magnesia* and the tincture of senna, or with the compound decoction of aloes; or the compound infusion of gentian, or the infusion or decoction of cinchona with the infusion of senna, and warm tinctures.

210. *e.* In cases of protracted, irregular, complicated and reduplicating ague, as well as in those of a low form, and in those occasionally following remittents or continued fever in warm climates, the liver, spleen, and digestive mucous surface, are generally more or less diseased. The intermissions, even when distinct or perfect, are accompanied with great languor, general uneasiness, want of appetite, a foul or loaded tongue, a sense of oppression in the epigastrium and hypochondria, and unhealthy countenance and skin; the upper abdominal regions being often full, tumefied, or tense. Here, local depletions, if they be not contra-indicated, and *calomel*, followed by purgatives, as already advised, should precede the exhibition of quinine. We must not, however, wait for the removal of these signs of congestion and obstruction, before resorting to quinine or the bark; for the patient may sink too low, and vital

PRINGLE, and BROCKLESBY; and is most appropriate to the inflammatory states of ague. MOR-
TON gave a scruple of *chamomile flowers*, ten grains
of salt of wormwood, and as much of the calx of
antimony, every sixth hour; Dr. HEBERDEN,
myrrh in large doses; and Dr. CULLEN, *tormentil*
and *gentian* with *galls*.

215. c. The preparations of iron have been
employed, especially the *ferri ammonio-chloridum*
by STAHL, TRILLER, HUXHAM, and HARTMANN.
The *cyanide of iron* has lately been strongly re-
commended by ZOLICKOFFER, who prescribed it
in doses of four grains twice or thrice daily.—The
trinitrate of *bismuth* has likewise been given by
HENKESSEN; *phosphorus* with bark, by HUFELAND;
the flower of *sulphur*, in full or large doses, by
RIVERIUS and De HAEN; powdered *carbon*, in
doses of two drachms, shortly before the fit, by
PIERQUIN; *ammoniated copper*, by M'CAUSLAND,
BIANCHI, and BRERA; DIPPEL's *animal oil*, by
WERLHOF and HALLER; and *cobweb*, by PAULINI,
GRANT, and JACKSON.—I have given the *chlorate*
of potash with benefit in the decoction of bark, and
in the infusion of valerian, with a little tincture of
capsicum. *Charcoal* was employed in ague by
JACKSON, CALVERT, and TULLY (*Edin. Med. and*
Surg. Journ. vol. x. p. 15. 403.), and was found of
service when the gastro-intestinal mucous surface
was much affected.

216. d. The barks of various astringent, tonic,
and aromatic trees and plants have been tried,
both before the introduction of the *cinchona* into
practice, and subsequently as a substitute for it.
The most esteemed of these are the *willow bark*.
This substance was prescribed by CLOSIUS, GÜNZ,
STONE, RESENBLAD, THILENIUS, HILSCHER,
JAMES, STYX, and WHITE; the *angustura bark*,
by WILKINSON and BRANDE; the bark of the *Swie-*
tenia febrifuga, by ROXBURGH; *cascarilla bark*,
by HECKER and others; the *pomegranate bark*,
by REHMANN; the bark of the *Ilex aquifolium*, by
ROUSSEAU; the barks of the *chestnut tree*, of the
elm, and of the *oak*, by various writers; and the
carapa bark of South America, which has been
said to have succeeded where *cinchona* had failed.
Various other stimulating, aromatic, and tonic
vegetables have been employed, and some of them
are still in use, either as adjuvants of the bark, or
of quinine; or in the form of infusion, as vehicles
for other substances. The most useful of these are
quassia; *serpentaria* (LYSÖNS, &c.); *Calamus aro-*
maticus (GULBRAND, MOSELEY, and HORN); *ar-*
nica (AASKOW, &c.); and *Capsicum annuum*
(BERGIUS and myself).—*Ammonia*, *camphor*, the
ethers, *castor*, *musk*, *myrrh*, *ginger*, *black pepper*,
garlic, *mustard seed*, &c. have likewise been em-
ployed, chiefly as adjuncts to more permanent
stimulants and tonics, or in large doses with opium,
shortly before the accession of the fit. Of these,
the most serviceable are *camphor* and *ammonia*.
Piperin, the active principle of black pepper, has
been lately employed by BERTINI, GORDINI, and
others, in doses of one or two grains, to arrest the
paroxysms; and *salicina*, and alkaloid found in
willow bark, has been very recently recommended
as a substitute for quinine. *Ignatius's bean*, and
the preparations of *nux vomica* were formerly used
against ague, by PAULLINI, BOURIEU, AASKOW,
CULLEN, HORN, and FOUQUIER; and their ac-
tive principle, *strychnia*, may also be found useful
in the lower grades of the disease, especially when
complicated with *diarrhœa*; in which, as well

as in the *dysenteric* complication, the *tormentil*,
ipecacuanha, *Dover's powder*, the *hydrargyrum*
cum creta, and *opium*, are useful adjuncts to
other medicines.

217. e. The *mineral acids*, especially the *hy-*
dro and *nitrochloric*, have been given in the
decoction of bark, especially when the liver or
spleen have been enlarged. I have employed
the latter in such cases; and, in a state of very
weak solution, as a common beverage for the
patient during the intermissions. The *sulphuric*
acid, similarly exhibited, has been recommended
by STORCK and JOERDENS. It is an useful ad-
junct to the sulphate of quinine. The *citric* and
acetic acids have been directed, but chiefly as an
addition to the drink taken in the hot stage, in
which, however, acid drinks should not be taken,
as they tend to diminish the perspiration, which is
more or less salutary.—*Ethers*, especially the
sulphuric and *hydro-chloric* have also been pre-
scribed in large doses, either alone, or with *cam-*
phor and *opium*, shortly before the paroxysm, with
the view of shortening the cold stage (HOFMANN,
CLUTTON, and DAVIDSON).—The *volatile alkali*
has been likewise employed similarly combined,
and with the same intention; and the various pre-
parations of *antimony* have been given before and
during the paroxysm, and throughout the inter-
missions, in conjunction with bark or other terti-
fuge tonics. *Alum* was at one time much used in
ague, it having been recommended by ETTMÜLLER,
LINDT, MÜLLER, and others. LANGER and De
MEZA prescribed it with aromatics, and *sulphuric*
acid, or *ether*; and ADAIR, with *cinchona*.—
The *sulphate of iron* has been tried by several
writers; but is of inferior efficacy to the sulphate
of zinc, or to the *tincture of the sesqui-chloride of*
iron. The *Prinos verticillatus*, and the bark of the
Prunus Virginiana, and *P. silvestris*, have been
mentioned in favourable terms by BARTON and
other writers; the bark of the *pine*, by BERZELIUS;
and *valerian* and *gentian*, by VAIDY and
others.

218. f. *Anodynes* have been used in conjunction
with, and as adjuvants of, antispasmodics, stimu-
lants, and diaphoretics. *Opium* has been exhi-
bited with these, and with antimonials, shortly
before the fit, by M'CAUSLAND, BREDA, and TRE-
MANN; with *camphor*, by SENAC and AMELING;
with *ipecacuanha* and *nitre*, by DOVER; and with
aloes and *camphor*, by AUDOUARD. The extract
of *belladonna* has been prescribed with bark and
other tonics, by HUFELAND and ERDMANN; the
Lauro-cerasus, by BROWN LANGRISH; *bitter al-*
monds, by BERGIUS; and the powdered leaves of
the *Laurus nobilis*, by Sir G. BAKER, given in
doses of two scruples, in bitter decoctions, shortly
before the paroxysm.

219. g. In old and protracted cases, attended
by infarction of the abdominal viscera, *mercurius*,
especially *calomel*, have been employed in fre-
quent doses, until slight salivation was produced,
by WILLIS, STAHL, BAKER, and LYSÖNS; and the
propriety of the practice, in some circumstances,
is confirmed by more modern experience.—In
similar cases, repeated *frictions* of the surface have
proved serviceable, especially with some one of
the liniments prescribed in the APPENDIX (F. 294,
311.). *Frictions* along the spine, with stimulating
substances, have been advised by HAUTESMEER,
VAN SWIETEN, De HAEN, TENEA, and others
rubefacients and *blisters* over the epigastrium and

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See also the BIBLIOGRAPHY to *Fever in general*; and *Flouquet's Repertorium*, which contains a numerous list of foreign works, down to the commencement of the century, very few of which are here referred to.

XII. REMITTENT FEVER. SYN.—Exacerbating, Paroxysmal, Sub-continual, Endemic, Endemial, and Endemical, Fever, of various writers.

225. DEFIN.—The febrile phenomena consisting striking exacerbations and remissions, one paroxysm occurring in the twenty-four hours.

226. This fever, although holding a middle rank between agues and continued fevers, approaches the former most nearly in its causes, phenomena, and consequences. It is most common in warm climates, and in the warmer countries without the tropics, in which it is most prevalent in summer and autumn. It is strictly a disease of locality and climate, and hence very generally denominated *endemic*; but as climates and localities vary remarkably, so is it modified in character from the mildest form, in which it is similar to simple ague in every respect but the complete remissions, to the more malignant states, in which it so nearly approaches yellow fever in warm countries and seasons, and continued fever in temperate climates, as to have been frequently confounded with them. To intertropical practitioners, especially, as well as to those in temperate countries which abound with the endemic causes of disease, this fever presents great interest. It is not infrequent in the vicinity of London; and in marshy localities in the southern counties of England, and Ireland, during the summer and autumnal months.

227. i. CAUSES.—The predisposing and exciting causes have been noticed above (§ 194.), and more especially in the articles *DISEASE* (§ 31. 55.) and *ENDEMIC INFLUENCES*. *Dr. Chambers* has supposed that remittents arise from two principal sources:—1st, from marsh-miasmata; 2dly, from sudden vicissitudes of atmospherical temperature precipitating some other deleterious principle evolved from hidden sources.—Of this latter, however, we can have little or no knowledge; and, even granting the evolution of such a principle, we have no evidence of any sources from which it can arise different from those pointed out in the articles now referred to. As, therefore, the exciting causes of endemic fevers in adults are chiefly emanations from the soil—from decaying organic bodies on its surface or commingled with it—and from stagnant putrid water; and, as these causes are necessarily varied in concentration, activity, and in their nature, according to the states of the air, and to the varying proportions of vegetable and animal matters undergoing decay, so it must be inferred that the effects produced by them, even when the constitution of the recipients is the same, will be also varied: but, when we consider the great variety of habit, organization, temperament, and susceptibility, it must necessarily be concluded that the forms and states of fevers resulting from

constant. In the most severe and unfavourable cases, yellowishness of the skin, or vomiting of matters like coffee-grounds, or both, occasionally supervene. The bowels, which, before the attack and at its commencement, were torpid, are, at further advanced stages, irritable; the evacuations being watery, greenish, and, at last, almost black; the urine being very scanty and high coloured. If the disease be not actively treated at the commencement, an unfavourable termination takes place between the third and seventh days; but it is often prolonged beyond this period, and it then generally occasions visceral disease.

231. Such is the inflammatory remittent of warm climates. A nearly similar fever attacks unseasoned Europeans lately arrived in the West Indies and inter-tropical Africa, and often presents an obscurely remittent or almost continued type. It has been very generally mistaken for true yellow fever, owing to the malignant symptoms it assumes at an advanced period, or state of exhaustion consequent upon the vascular excitement of the early stage. The inflammatory remittent, the bilious inflammatory, the adynamic or malignant remittent, and the ardent or seasoning fevers of Europeans lately arrived in warm countries, are merely modifications of each other, and differ essentially from epidemic yellow fever, with which, however, they have been all most singularly confounded.

232. *C. Bilio-inflammatory remittent fever* differs but little from the foregoing in its characters and course. It is most prevalent in Europeans who have not resided long in a warm miasmatic country, and in low marshy localities, or in thickly wooded districts. In temperate climates, it is observed chiefly in the autumns consequent upon very warm summers; and in the bilious or bilio-sanguineous constitutions. It is often dependent upon the vicissitudes of season, especially wet seasons following great warmth, or a very hot summer consequent upon a wet spring; and it is often very prevalent or almost epidemic during the hot months, after very heavy rains, within the tropics. Violent determination to the brain characterises the commencement of reaction, in this variety; and inordinate affection of the liver and digestive mucous surface, the more advanced stages. Pain in the head is most severe, especially in the forehead and sockets of the eyes; the conjunctiva is yellow or suffused; the countenance and skin become dusky or yellow; the tongue is loaded by a bilious coating; and the evacuations are bilious; especially the matters thrown off the stomach. The bowels are at first costive, but they afterwards often become irritable or dysenterically affected. After the vomiting has continued some time, the appearance of the matters is changed, and ultimately assumes in fatal cases the characters just described (§ 229.).

233. *D. The adynamic or malignant remittent* is one of the severest and most fatal of endemic fevers. — *a.* It is observed only in places where the endemic causes are concentrated or intense relatively to the state of predisposition; and is seldom ushered in by shiverings, but generally by a prolonged sense of cold, universal collapse of the vital powers, and of vascular action. Pain in the head of a peculiar constrictive kind; mental depression and insane delusions; imperfect efforts

at reaction; remarkable lassitude and pain in the loins and limbs, are present at the commencement, with great anxiety, pain, and oppression of the præcordia, and nausea, sometimes giving rise to vomiting, which assists in developing the stage of excitement, and in partly overcoming the internal congestions. The pulse is small, constricted, or irregular; the skin becomes dry and caustic, or moist and clammy; and impresses the hand of the observer with an acrid or tingling sensation; the eyes are watery and injected; the tongue is clammy, moist, or flabby and coated, and afterwards dry, rough or brown; the face is flushed, but dusky or purplish: the bowels are costive, subsequently relaxed or irritable, and the urine is scanty, high coloured, or suppressed. After twelve or fourteen hours, a slight remission is observed, after which the symptoms are exacerbated; the stomach is remarkably irritable; the epigastrium painful and tumid; the breathing hurried; and the patient restless and distressed. In the more dangerous cases, hiccup, constant vomitings, yellowish discolourations of the skin, exudations of blood from the digestive mucous surfaces, low delirium, and death, supervene between the fourth and seventh days.

234. *b.* This variety is variously modified, in different circumstances and persons. It sometimes assumes more of a *cerebral or typhoid character*; at others, it is *bilious or gastric*, according to peculiarity of season or concentration of the cause. In some inter-tropical countries it becomes epidemic, or rather this endemic is more than usually prevalent. Occasionally the remissions are indistinct from the commencement, and they generally become so after three or four days. — *a.* In some cases the vascular excitement is at first more or less intense, with remarkable determination to the head, liver, and stomach, and maniacal delirium, the disease very nearly approaching the inflammatory, or bilio-inflammatory forms. — *β.* In others, vascular reaction is very low and imperfect; the pulse small and quick; the abdomen tumid and hot, whilst the extremities are cold or clammy; the evacuations foul, morbid, and offensive; the tongue fuliginous; the gums, spongy, or oozing a bloody sanies; the vomiting constant, and ultimately grumous and dark; the stools towards the close, black or pitchy; the urine scanty or nearly suppressed; the solids flaccid; and the skin earthy or discoloured. In both these states, a yellowness of the surface occasionally presents itself about the third or fourth day, beginning in the conjunctiva, neck, and breast. The yellowness often passes to a pale greenish hue, in patches, shortly before death; and the soft solids present a liquescent state, having lost their vital cohesion.

235. *c.* In other cases of this form, the symptoms are at first mild, and the excitement inconsiderable; when, after two, three, or four exacerbations, the powers of life appear suddenly exhausted; the pulse becomes weak and fluttering; the tongue foul, black, and dry; the evacuations offensive; the prostration of strength extreme; and the fætor of the perspiration remarkable. At last, great anxiety; tenderness and tension of the epigastrium; fulness of the hypochondria; collapsed features; a squalid or yellowish surface; vomiting of dark or grumous matters, supervene, and indicate the utmost

more rarely in warm climates. The pulmonary functions are more or less impaired during the formative and invading periods; but acute disorder is seldom developed until the period of excitement, and consists chiefly of *bronchitis*, *catharrh*, and *pneumonia*, of a nervous or congestive form. In some cases *congestion* of the lungs, and of the bronchial surface, commences during or shortly before the period of invasion; and either partially continues throughout the disease, or passes into a low form of inflammatory action, and even into hepatisation. *Rheumatism* is also occasionally complicated with remittents; and *erysipelas* sometimes supervenes when a part is injured, the cuticle abraded, or the skin divided. *Ulcers* and *sores* not unfrequently take place on the lower extremities in the course of remittents, as well as of intermittents, particularly in low, wooded, and swampy districts within the tropics.

241. *F. The terminations of remittents* are—1st, In restoration of the healthy functions;—2d, In a chronic form of remittent;—3d, In organic change of one or several important viscera, particularly of those which manifest predominant disease during the progress of the fever;—4th, In fever of a different type;—5th, In dysentery;—and, 6th, In death. Although any of the *consequences* pointed out above (§ 47. 189.) may arise, changes of the viscera of the abdominal cavity are by much the most common, in this class of fevers, as well as in agues. The *Prognosis* is apparent from what has been advanced, and in every respect agrees with what has been stated on the subject above (§ 57. *et seq.*).

242. *G. The lesions observed after death* from remittents, as respects both their seat and nature, differ but little from those already described in connection with agues. They, however, are of that kind which are generally observed to result from acute action in connection with deficient power. The *liver* is usually injected, remarkably softened, of a dark colour, friable, and sometimes enlarged. The *spleen* is often so soft as hardly to admit of being handled. The *digestive mucous surface* is softened, injected, ecchymosed, of a dark hue, and sometimes thickened, abraded, or even ulcerated in the lower parts of the canal. The *mesenteric glands* occasionally, and the *pancreas* more rarely, are enlarged or otherwise changed. The *bronchial lining* is generally dark, injected, and soft. The *lungs* are sometimes congested, infiltrated, condensed, or inflamed. The *pleura* and *pericardium* often contain some dark sanguineous serum; and the substance of the *heart* is frequently soft, flaccid, and readily torn, the cavities being occasionally dilated, more especially after the adynamic states of the disease. Adhesions between the *pleuræ* are rare. The changes within the *cranium* consist chiefly of congestion of the veins of the *pia mater* and sinuses, with a fluid dark blood; and sometimes of effusion of serum into the ventricles, and between the membranes. But the lesion of the *encephalon* are seldom very great, or in relation to the severity of the cerebral symptoms during life.

243. iii. *DIAGNOSIS*.—It might be supposed that the remissions would be a sufficient characteristic of this fever, and they certainly are so as respects the remitting type. But the occasional occurrence of yellowness of the skin, and of black vomit, in the advanced stages of its more intense forms, has

been the means of confounding it with two other species of fever, in which also yellowness of the skin and black vomitings occur—the *bilio-inflammatory* or *ardent fever*, which attacks only new comers to an inter-tropical country, especially America and Africa—and the *true infectious yellow fever*, which sometimes spreads in a most pestilential form. The more intense and adynamic forms of remittent, the bilio-inflammatory or ardent seasoning fever of Europeans recently arrived in a hot climate, and the true yellow fever arise from different causes, and present different phenomena at their commencement and early course, although the character of the symptoms often approximates in their last stages.

a. 244. As respects the *intense and adynamic states of marsh remittent*, it has been shown above that the exacerbations seldom continue above fourteen or eighteen hours, so that one takes place daily, varying, however, in intensity, so that they thus usually present a quotidian or double tertian type; but in the *bilio-inflammatory*, or *ardent seasoning fever* of Europeans, the type is continued, or a remission does not occur till after thirty or thirty-six hours, a different train of symptoms then usually appearing. These two fevers arise from different causes;—the *remittent* always proceeds from malaria in some form; hence it is common to all warm countries, and to temperate regions in warm seasons, and varies remarkably in severity; the *bilio-inflammatory* or *ardent fever* may probably also arise from the same cause, but it is more especially the effect of temperature upon European constitutions, or of atmospheric vicissitudes and other causes acting concurrently with these; hence the much greater uniformity of its character, in which it nearly approximates to the bilio-inflammatory form of the remittent. While remittents can, in every instance, be traced to terrestrial exhalations—to the sources described in the article ENDEMIC INFLUENCES, ardent fever often appears where the operation of such causes has been impossible, and where I have endeavoured in vain to account for its occurrence, excepting in the way stated hereafter.

245. b. These two diseases are the *seasoning fevers of Europeans arrived in a hot climate*—ardent fever commonly appearing in robust plethoric persons who have emigrated to the West Indies, inter-tropical Africa, &c.; the intense forms of remittent, in those less robust, or who have not been attacked by ardent fever, and who have been exposed to malaria after their arrival. This statement is illustrated by the following facts, which came under my own observation in 1817 and 1818:—Some young men arrived from Europe in a place within the tropics, during the healthy season, and where no sources of malaria then existed. They were attacked by the common ardent fever, with two or three exceptions, and recovered by means of the treatment advised for this disease; but during the unhealthy season, several of them had remittent fever; and those who had not been attacked by the ardent seasoning, had the more severe forms of remittent, which was their seasoning. In the East Indies, bilio-gastric fever and the inflammatory forms of remittent are the most frequent fevers in recently arrived Europeans, but in the West Indies, ardent fever is the most common, especially in the young, plethoric, or robust—in those much exposed to the sun's rays.

with a due knowledge of disease and of therapeutical agents, but perfectly unbiassed by doctrine or by the reputed efficacy of certain modes of treatment; otherwise, he may find out, after some untoward experience, that neither the doctrine, nor the practice founded on it, applies to the cases which he is called upon to treat. I never shall forget with what bitterness an amiable physician many years ago told me, on my meeting him in an unhealthy climate within the tropics, where he had arrived some months before myself, of his want of success in treating the fevers of the country. Being desirous of the guidance of those who had written on the disease, he had treated it at first conformably with the instructions given in books, and the first nine cases terminated fatally in rapid succession. The practitioner should observe and think for himself; and whilst his mind is open to the suggestions which works will furnish, he should ascertain the states of vital power, and of local and general morbid action, in each case, and employ medicinal agents appropriately to these, and with promptitude and decision, guided but not weakened by caution.

248. iv. TREATMENT.—*A. Of the mild remittent.*—The treatment of this form differs not materially from that advised above for agues, especially when the remissions are distinct. At the commencement, before reaction is developed, and when there are no indications to forbid their exhibition, *emetics* are generally of great benefit. After their full operation, a large dose of *calomel*, or of *calomel* and *opium*, may be given, and an action produced on the bowels by *purgatives* and *cathartic enemata*. These means having been repeated until morbid secretions and *fæcal accumulations* are evacuated, *bark* or *quinine* may be prescribed, if the remissions are distinct, and the patient not removed from the unwholesome locality. But in cases where the previous health and long residence of the patient in an unhealthy climate do not forbid it, moderate *bleeding* in the stage of excitement will shorten the disease, and render the remissions more perfect. During reaction in the early exacerbations, repeated doses of *James's powder* with *calomel*, or the *potassio-tartrate of antimony* given in solution every hour or two, or every half hour, in full doses, commencing it in the cold stage, so as to produce vomiting, and continuing it in this manner throughout the subsequent reaction, will frequently accelerate a favourable termination; and render large vascular depletion less necessary. In old residents in warm climates, or in those constantly living in an unhealthy situation, this medicine will often supersede bloodletting, if the bowels are early and freely evacuated. In the mild autumnal remittent, also, of this climate, a similar treatment is appropriate; bleeding being required chiefly in the young, robust, and plethoric. Subsequently, refrigerants, cooling diaphoretics, and other appropriate means may be employed.

249. *B.* In the *inflammatory and bilic-inflammatory forms*, the practice, early in the disease, should be energetic.—*a.* In the cold stage, or that of invasion, and when, although there may be most severe headach, the heat of the scalp and the action of the carotids indicate that it is not inflammatory nor dependent upon fulness of blood; and when excessive vascular action in the stomach and liver has not yet been developed,

an active *emetic* is of essential service. As soon as the stage of excitement is developed, and proportionately to its excess, and to the degree in which vascular action becomes predominant in the head, liver, or stomach, should *bloodletting*, generally or locally, or both, be practised; the quantity having relation to the constitution, habit of body, &c. of the patient. In order, however, that depletion may be productive of benefit, it must be practised early in the disease; for, if deferred till the excitement has partly exhausted the powers of the system, its good effects cannot then be obtained; the nature of the pathological states admitting of *local depletions* only, which, however, should be employed in order to remove such local congestions as may have taken place.

250. *b.* Full doses of *calomel*, followed by *purgatives* (F. 181. 216. 266.) and *cathartic enemata* (F. 140, 141. 150.) are also early requisite; the first of these having been given soon after the operation of the emetic, and combined with *James's powder*. During the vascular excitement, particularly when the skin is very hot and dry, the cerebral symptoms strongly marked, and the abdominal viscera free from congestions, *cold applications* should be kept to the head, and the *cold affusion* frequently resorted to. When vital power is much impaired by the impression of the exciting causes, or exhausted by the previous excitement, and when the abdominal viscera are congested, as evinced by the fulness and tenderness of the hypochondria and epigastrium, the cold affusion is a hazardous measure, the constitutional powers not being always sufficient to bear the shock, and the overloaded viscera sometimes suffering further from the external impression. In such circumstances, especially when the pulse is quick and irritable and the skin harsh, the *tepid bath*, and sponging the surface with cold or tepid water, will be preferable. A certain degree of vital power is necessary to a successful application of the cold affusion; the surface being hot and dry, and the internal viscera not seriously congested.

251. *c.* When the head is much affected, *leeches* to the temples, behind the ears, and to the occiput, or cupping, will be serviceable; evaporating lotions, or the cold affusion on the scalp being resorted to: but even these may be injurious if employed too late, or in states of exhaustion. The appearance of the face and eyes, the heat of the scalp, the expression of the countenance, and the action of the carotids should guide the practitioner, and not the degree of delirium or of insane delusion; for these may be most remarkable where vascular action in the brain is lowest, as they depend more upon nervous and cerebral power than upon vascular action. When much heat, pain, tenderness, and fulness of the *epigastrium* or *hypochondria*, with nausea and vomiting, are present; the matters thrown up being viscid or ropy and abundant, and yellow, green, or yellowish green, or dark green, or colourless, and mixed with albuminous flakes, energetic vascular depletion should be early resorted to, otherwise the vital tone of the mucous coat and capillaries of the stomach will be soon exhausted, and dark græmous vomiting supervene. In these cases, a large bloodletting from the arm, and twenty grains of *calomel*, with two or three of *opium*, should be promptly prescribed.

or eighteen hours, and followed by the calomel and opium; and the bowels ought to be freely opened. In the worst forms of marsh fever, particularly in hot climates, the secretions of the liver are often interrupted or suppressed, large doses of calomel and active purgatives being especially required in them. If the mouth become affected, the circumstance is favourable, although we should hardly make this a specific indication unless other intentions be also fulfilled. The warm bath, followed by frictions of the surface, or by the terebinthinated epithem on the abdomen, and by diaphoretics, will also be of great service.

255. *b.* Whilst vascular depletions are thus necessary in the more concentrated and inflammatory states, which rapidly pass into the adynamic or malignant form, they are inapplicable to those in which the powers of the system are insufficient to produce vascular reaction; at least, they should never be employed until efforts at reaction are made, when a small or moderate general or local bleeding may be directed, especially after the warm or vapour bath and frictions of the surface, with the view of relieving the overloaded vessels of the large viscera, and of removing congestion of the venous trunks and auricles of the heart. If an adynamic state has continued from the commencement, the skin of the trunk being harsh and dry, the extremities damp, the pulse weak and rapid or irregular, the tongue dark and coated, the bowels disordered or costive, and the evacuations morbid, the vital energies of the frame should be roused by means of the hot or vapour bath; by assiduous frictions with stimulating liniments (F. 299, 300, 311.); and internal congestions removed by warm diaphoretics, stimulants, purgatives, and mustard poultices, or the hot turpentine epithem applied over the epigastrium and hypochondria, and, in extreme cases, on the insides of the thighs also. In this latter class of cases, calomel is still indicated, especially if the stomach be irritable; but it should be conjoined with large doses of either camphor, ammonia, or capsicum, with opium. Subsequently, the bowels having been very freely evacuated, and the states of the tongue, of the pulse, and of the skin not forbidding, bark in decoction, or sulphate of quinine, may be prescribed.

256. *c.* A similar treatment is indicated when an adynamic or malignant state supervenes on that of low excitement — when the skin becomes yellowish or dusky, and the irritability of the stomach urgent or disposed to pass into the dark grumous vomitings, indicating great danger. This affection of the stomach is much more violent when it is consequent upon excitement than when it occurs in the course of a fever in which excitement has been imperfectly expressed; for, in the former case, the vital power of the organ is exhausted, and the organisation affected; in the latter, power is simply diminished or suppressed, restoration being more easy in it than in the former. In both circumstances, the external derivatives just mentioned, and calomel in the combinations specified, are chiefly to be relied upon. When the vomiting consists of a pumping up of the contents of the stomach, rather than of active retchings, cordial stimulants should be employed in addition to these; and aromatic spices, am-

monia, ether, camphor, opium, &c., may be variously combined. Fluids evolving carbonic acid, as spruce beer, seltzer-water, soda-water, bottled stout, &c., may also be prescribed. In a few urgent cases, I have found from half an ounce to an ounce of the spirits of turpentine, taken on the surface of milk or any aromatic water, with half a drachm of magnesia, allay the irritability of the stomach, lower the pulse, and render the tongue moist, after other measures had failed; and I have exhibited this dose, or F. 216., as a purgative, three or four hours after a bolus consisting of ten or fifteen grains of camphor and calomel, with one, two, or three of opium, had been taken; promoting the action of the bowels by warm cathartic enemata, if necessary.

257. *d.* In low, miasmatic districts, bark or quinine, in suitable combinations, is often necessary in an advanced stage of the adynamic state. The former in substance, however, or the latter in large doses, generally irritates the stomach, and it then proves injurious. The infusion of bark, therefore, with the chlorate of potash, or with hydrochloric acid or ether; or the decoction with hydrochlorate of ammonia, or with nitrate of potash, and the solution of the acetate of ammonia; should be first employed: and subsequently, the quinine with acids. But while we thus endeavour to support vital power, morbid secretions and faecal collections should be fully evacuated, either by mild purgative draughts, — and preferably by those of a stomachic or tonic kind, — or by enemata, or by both. If the combination of the mild preparations of bark with the antiseptics and refrigerants just instanced are inefficacious, the more energetic preparations with ether, or the preparation of ammonia, or with aromatics, &c. must be resorted to.

258. *D.* The complicated states must be treated with reference chiefly to the condition in which vascular action and vital power are manifested. The treatment of the more inflammatory complications has been already described. The complications of the more adynamic states are so diversified, that the measures already recommended, as well as others about to be noticed, must be adapted to individual circumstances. If an irritable or dysenteric state of the bowels occur, morbid secretions or faecal accumulations have probably caused irritation of the mucous coat. A full dose of calomel should therefore be given, if it have been neglected, and be followed by a common purging draught, by castor oil, or F. 181, 216, 266.; and, in a few hours, laxative enemata, and demulcents should also be administered. After the full operation of these, anodynes, with gentle alteratives and light tonics, or the preparations of bark or quinine in the forms above mentioned, may be exhibited. In the adynamic states, this complication is very unfavourable, especially when the stools are very dark, black, or otherwise morbid, and the abdomen swollen and painful. Calomel, with camphor and opium, is necessary in such, and large blisters, or the other external applications previously directed (§ 251.), are especially indicated. Tonic purgatives, &c. are also requisite; and bark or quinine in large doses, and in forms of combination most appropriate to the particular class of cases. The other complications either have been already noticed, or demand no material modification of the treatment. When seated in the head, thorax, or abdomen, the state

265. *B.* The symptoms consist chiefly of great muscular weakness, which often appears unaccountable, of sinking sensations, and disinclination to exertion. A slight chill is often present in the forenoon, or about midday, or a creeping cold down the spine. During the afternoon, evening, and night, a slight degree of febrile excitement is manifest, and the palms of the hands become hot or burning. The tongue is generally white, and the apex and edges are often somewhat red. The urine is often pale and abundant in the morning, and higher coloured, and more frequently voided, in the evening and night. The patient is sometimes unable to follow his occupations in the morning; he awakens unrefreshed, either from a feverish, restless, or disturbed sleep, or from a lethargic, dreamy, and prolonged sleep; he is fatigued all morning, without knowing wherefore; is depressed, anxious, and irritable; or complains of want of mental energy or ability, and of dull headach; and, as the chills and sinkings of this period pass into a gentle febrile excitement, he feels more restored in the afternoon or evening. In the case of a delicate, most talented, and accomplished female, subject to this disease, and liable to relapses of it during cold easterly winds, although the most distressing, sinking, and exhaustion were often felt in the morning, so that she was hardly able to dress herself, or to get up to breakfast; yet she often could in the evening exert and enjoy herself. The pulse is occasionally not materially disturbed: it is frequently accelerated and a little hard, in the course of the exacerbations, but is commonly weak and slow in the remissions. The bowels are generally sluggish; the evacuations slightly disordered; and the appetite, when the heat is considerable, and the exacerbations very marked, is much diminished, and generally capricious. The patient loses flesh during the attacks, and various anomalous symptoms referrible to the stomach, bowels, and other abdominal viscera, often present themselves; and, when they become prominent, are liable to be considered and treated as the original complaint.

266. In many cases, although these ailments are both real and distressing, the patient is considered as either feigning, or hypochondriacal. In these more especially, and when the course of the complaint is less regular, the time of the day when the exacerbations and remissions occur, varies much. If they are tolerably regular, they often present a quotidian, tertian, or double tertian character, the symptoms being worse on alternate days. In the more chronic cases, the mind becomes irritable or despondent, and in some instances this latter feeling is most distressing. Dr. ELLIOTSON confirms the remark of Dr. MACCULLOCH, that the exacerbations are often unobserved from occurring in the night; increased heat, oppression of the head, and depression of spirits, amounting to hypochondriasis, being the chief symptoms. The nights are frequently the periods of greatest suffering. A gentleman, who consulted me in the summer of 1834, described them as being most distressing. In another case, an inability to think, with confusion of ideas, was complained of; an inflammatory dyspepsia, a burning sensation at the stomach, and other symptoms of irritation of the digestive mucous surface; sponginess of the gums, and soreness of the tongue, which often becomes

smooth and divested of its papillæ, occasionally appear in the advanced course of the disease; and ultimately serious disorder of the abdominal organs, prostration of organic nervous power, and a state of ill health, amounting to general disease, supervene.

267. In some instances, this complaint assumes more of the intermittent character, and at different times it seems to vacillate between the remittent and intermittent types; but there is rarely any distinct cold stage or a greater feeling of cold than that above mentioned (§ 265.), excepting at the commencement of an attack, or of a relapse. Signs of functional disorder of the liver, and of torpid function of the colon, often appear, especially in this class of cases; and the disease is frequently considered a form of liver complaint; the heavy or dull headach sometimes attending it being imputed either to the same source, or to the accompanying affection of the stomach.

268. In conclusion, Dr. MACCULLOCH describes this form of remittent as modified chiefly in degree and duration, it being often so slight as to require some attention in tracing its form, and even its existence. It is apt to become habitual, or to recur at frequent but variable intervals, during even an indefinite course of many years; varying in such a course its characters and symptoms, and being in some cases a marked chronic intermittent, in others remittent, and in some so brief and imperfect in its remissions as to be almost continued. Its accessions are of the ordinary duration of remittents, and they commonly observe the quotidian or double tertian periods. It is, moreover, often a primary disease: sometimes it is consequent upon ague, or the severe states of remittent, or even upon continued fever; and, whilst it is especially caused by malaria, in some of the slighter modes of this poison, it may possibly arise from other sources; or, after a first attack, a relapse may be caused by cold, moisture, atmospheric vicissitudes, the use of cold or drastic purgatives, vicissitudes of temperature, intemperance, bloodletting, and excessive evacuations.

269. TREATMENT.—*a.* The slighter, primary, and more recent states of this complaint are removed by the sulphate of quinine, the preparations of bark combined appropriately to particular cases, by FOWLER'S solution of arsenic and change of air; the bowels being duly regulated by laxatives, or mild purgatives combined with bitter tonics (F. 266. 562. 572.) But the more chronic states, especially when the nervous system is much affected and the patient has become desponding and hypochondriacal, are treated with much less success. If it degenerate into confirmed hypochondriasis, the case is one of the most difficult that comes before the practitioner. In some instances an active exhibition of sulphate of quinine is of great benefit. Dr. ELLIOTSON alludes to a case in which five grains were given three times a day without benefit; but the dose having been increased to ten grains, relief was procured. When signs of inflammatory irritation of the digestive canal exist, the decoction of bark should be first employed with the nitrate of potash, or with the hydrochlorate of ammonia; and if the tongue be flabby, and the gums spongy, as in the case above alluded to, the decoction may be given with hydrochloric acid, or with the nitro hydrochloric, or with the chlorate of potash. The combination of

the root. Fever supervenes, and is ushered in by cold, rigors, or chills; the child being hot and restless at night. The febrile exacerbations generally recur in the afternoon, and during the night; but there are often three fits, one also occurring in the forenoon; and, in the most severe cases, the remissions are very indistinct. During the *exacerbations*, the child is drowsy; and, if it sleeps, starting, moaning, and even screaming, or incoherence, are observed; sometimes with vomiting, flatulent distension of the abdomen, accelerated respiration, and cough. The pulse varies from 120 to 160, according to the age. The cheeks are usually flushed; the abdomen and palms of the hands being hotter than other parts of the body. Occasionally, the paroxysm terminates in a slight perspiration, which is often partial; the child falls into a quiet sleep, and the pulse sinks in frequency. During the *remissions* he picks his lips or nose; is irritable, and without appetite. The bowels are acted upon with difficulty; the evacuations are generally unnatural, but present no constant character; and worms are occasionally voided. The urine is now transparent, of an orange colour, and its quantity in relation to the fluids taken; and all the other symptoms noticed above are present in an aggravated form. As the disease declines, the exacerbations become mild and short, and often terminate in a gentle perspiration, with a sound or refreshing sleep; the urine deposits a sediment, and is pale; the appetite returns; and the stools assume a healthy aspect. But the pulse remains frequent, and the flesh and strength are regained very slowly, unless change to a mild dry air is adopted. If this form of the disease be either neglected, or improperly treated, or if the child remain in a moist or miasmatic situation, organic change, in some important organ supervenes; or the complaint passes into the chronic form, hereafter to be described; or degenerates into marasmus from mesenteric disease. It usually terminates in from two to four weeks in the more favourable cases.

275. *B. The more adynamic variety*, or state of the complaint, is the least common; excepting in low, humid, and miasmatic situations. It is sometimes prevalent at the same season with the CHOLERIC FEVER OF INFANTS (see this article), evidently depends upon the same causes as it, and is a very closely allied complaint, differing from it merely in the type of the fever, and the degree in which the digestive canal is affected. This variety commonly begins more suddenly than the others; the earlier exacerbation being attended by the same symptoms as the preceding, but by greater affection of the head, and by delirium in the older children; and quickly passing into more or less exhaustion. When this change takes place, the child becomes quiet, or indifferent to external objects, and indisposed to the least exertion. He dozes, and is incoherent in the exacerbations; and, in the remissions, he lies in one position, constantly picking his face, particularly his lips and nose, until they become sore; or keeping his hands in continual motion. He usually, however, takes both food and drink, although sparingly. The countenance is anxious, pale, and unhealthy; the eyes reddish, especially the edges of the eyelids; the lips are covered with dark, ragged crusts, or exfoliations of their

epithelium; the tongue and teeth are loaded with dark sordes; the bowels are much disordered — often irritable; and the stools are very offensive, watery, greenish, or otherwise morbid, and preceded by much griping and flatulence; both the stools and the urine are frequently passed involuntarily. When a favourable change takes place, the symptoms gradually subside; the voice, which was nearly lost, is regained or becomes stronger; the eyes are more lively; the tongue is cleaner, and the evacuations improve; the exacerbations being shorter, and the remissions more perfect and prolonged. This variety is generally more chronic than the preceding, but less so than the next. It usually continues from one to two months.

276. *C. The chronic form of remittent* in children either makes its approach gradually and insidiously, or follows the acute. The child wastes; the abdomen enlarges; the breath is offensive, and the strength fails. There is commonly only one exacerbation in the twenty-four hours, and it seldom appears before evening, lasting till morning, and terminating in sweats. The pulse is usually about 100 in the day, but rises to 140 in the evening. The tongue is white or loaded, but moist, and has often a strawberry appearance; the bowels are generally costive, and the stools always morbid. The child commonly keeps up, but is disinclined to move, or complains of aching in the limbs on exertion. There is little or no appetite or thirst; and the other phenomena characterising the complaint, in its common form, are present in various grades of severity. If the disease is not removed, tympanitic distension of the abdomen, emaciation, harsh discolouration of the skin, enlarged mesenteric glands, aphthous sores on the lips and tongue, chronic diarrhoea, and lentergy supervene. When the disease declines, all the symptoms gradually amend; the nocturnal exacerbations abate; and convalescence is established after a period varying from two to four or five months.

277. This disease is generally sporadic, but is also sometimes epidemic. It is endemic in unhealthy localities; and many of the children born of European parents in hot or unhealthy climates are cut off by it before they reach their sixth or seventh year. When it occurs epidemically, it usually assumes the first or second of the above forms; and proves both more rapid in its course, and more dangerous, than in the ordinary states. — Dr. Sims, after describing the fevers prevalent in London in the years 1769 and 1770, which seemed chiefly to result from the endemic sources surrounding the metropolis and the state of the seasons, gives a very graphic account of this complaint, as it appeared epidemically during these years, and simultaneously with these fevers. As his description very nearly represents the disease as I have seen it in very low and miasmatic situations, I shall abridge it at this place. He remarks, that it was called by some a worm fever, though worms were seldom the cause; but as that apparently lay in the stomach and intestines, the error did not materially affect the practice. It was most common in children of a sallow complexion and thin habit, who had been over-fed, with the mistaken view of supporting and nourishing them. — The leading symptoms were, heat, thirst, quick, full pulse, vomiting, coma, and sometimes slight convulsions,

proved by the facts that such depravation must itself proceed from anterior disorder, and that a treatment based solely upon the above doctrine is not generally successful; a free and healthy state of the alvine evacuations being often brought about without the complaint being removed; — *f.* That, in order to cure the complaint with the least delay and the greatest certainty, it is necessary to evacuate morbid secretions from the *prima via*, to impart energy to the organic nervous system, and to change the morbid states of the various related or dependent organs.

282. *vi.* TREATMENT. — *A.* The practice advised by MUSGRAVE, BUTTER, SIMS, PEMBERTON, and others, although furnishing valuable hints, is more or less defective; for, whoever trusts to it alone, or those whose resources extend no further, will occasionally find the disease by no means so easily managed as they expected, and will see it prolonged until the treatment is taken out of their hands, and, by the common sense of the parent, limited to change of air, and light nourishment; which, although amongst the most efficient remedies, have been very generally overlooked by writers. In all cases the treatment should be commenced with a moderate dose of *calomel* and *James's powder* at night, and a sufficient quantity of the bitter aperient mixture (F. 266.) or of *rhubarb* and sulphate of potash, or of *rhubarb* and *magnesia*, to act upon the bowels. If these are inefficient, an enema should be thrown up; and from an experience of many hundred cases, I would recommend for this purpose equal quantities of castor oil and spirits of turpentine in water-gruel. At first, the above powder should be repeated every night, or on alternate nights, and the purgative in the morning, the injection being also employed every third or fourth day. At a more advanced stage of the treatment, and when the evacuations have improved, they may be prescribed less frequently. The choice of other means must depend upon the peculiar features of the case.

283. *B.* If the disease be of the form in which it usually presents itself (§ 273.), and the evacuations have been improved by the above means, an infusion of *cinchona*, or of *cascarilla*, or of *valerian*, with liquor ammoniæ acetatis, will be found of great service. If the bowels be still disordered and torpid, the sulphate of quinine may be given in a solution of any of the neutral sulphates; and the abdomen rubbed assiduously with a warm stimulating liniment (F. 311.), light nourishing diet, or a course of ass's milk, and change of air, being afterwards ordered.

284. *C.* If the complaint be of the acute form (§ 274.), and the child be plethoric and strong, a few leeches may be placed over the epigastrium at the commencement of the treatment, and afterwards a mustard poultice, or any *rubefacient epithem* may be applied; but the purgatives just mentioned, or similar medicines, should be prescribed; and the solution of acetate of ammonia with sweet almond emulsion, and camphor mixture, should be taken in the course of the day. After the more acute symptoms have abated, the infusion or decoction of *cinchona*, or the infusion of *cascarilla*, or of *calumba*, may be given with small doses of liquor potassæ, or of the hydrochlorate of ammonia, or the nitrate of potash, or with liquor ammoniæ acetatis, sweet spirits of nitre, &c.

285. *D.* When the disease assumes the adynamic state, above described (§ 275.), and when it has been of long standing, or considerable exhaustion has supervened, a further modification of the treatment is requisite. If the bowels have not been sufficiently evacuated, the above means should be employed for the purpose; and either the sulphate of quinine, or the preparations of bark, or of other tonics, especially *cascarilla*, ought to be taken during the remissions. In all the varieties of the complaint the remissions should be selected for the exhibition of bark, quinine, or other tonics, commencing at the subsidence of the exacerbation. In this state of the complaint, I have prescribed, for many years, the chlorate of potash in an infusion of *valerian*, or of *cinchona*, with great benefit, keeping the bowels moderately open, and directing the above liniment (F. 311.) to be rubbed along the spine, or over the abdomen.

286. *E.* When much pain is felt, and the belly becomes distended with flatus, the enema advised above should be administered; and either an anodyne fomentation applied to the abdomen, or the liniment rubbed upon it. MUSGRAVE recommends poultices, or fomentations with the warm decoction of rue and aromatic herbs. A decoction of chamomile flowers, poppy heads, and rue, in the form of fomentation; and a little spirit, or oil, of anise-seed, added to the medicine, will generally give relief. A warm bath at bed-time, or the semicupium, some salt, or mustard flower, or both, having been added to the water, will also be serviceable, especially in the low or advanced states of the complaint.

287. Dr. BUTTER placed much dependence upon the extract of *conium*, in doses of one grain in the day for every year that the patient was old, in conjunction with saline aperients. It is of little service of itself; but is often an useful adjunct to the medicines already advised, especially if the child be very peevish, the abdomen pained, or the bowels irritable. Dr. CHEYNE relied most upon colomel with antimony at bed-time, and the common purgatives, giving the former more frequently if the complaint seemed liable to pass into hydrocephalus. Dr. CLARKE and Dr. PAMARTON insisted chiefly on tonic infusions, after the bowels were freely evacuated. These are generally serviceable in the circumstances and combinations pointed out, and the addition to them of the extract of *conium* is also beneficial. In some old cases, in which there was reason to suppose that, in connection with debility, there was some degree of obstruction of the mesenteric glands, I have given the iodide of potassium internally, in small doses, with great advantage; but care should be taken not to prescribe it in doses large enough to irritate the stomach and bowels, otherwise it will increase the disorder.

288. *F.* The regimen and diet constitute a principal part of the treatment. Change of air, as early as possible, especially to a mild and dry air, and elevated situation, is always most serviceable. Warm clothing, frictions of the surface after the warm baths, and light but nourishing diet, are also very beneficial, particularly when convalescence has commenced. During the complaint, ass's milk, ruaks, and weak broth, are suitable food. But, in the acute form, or at the commencement of the disease, even these may be

menon which will enable us to recognise their precise seat and nature, and yet give rise to hectic fever.

291. Mr. J. HUNTER contended for its idiopathic existence, by supposing that the constitution may fall into the same mode of action, without any local cause whatever, as proceeds from such cause. This is, however, no argument. He further observes, that nothing is more common than for hectic to exist in patients in whom no local disease whatever can be traced; and that, in such cases, either random suspicions are to be thrown upon the lungs, liver, kidneys, heart, or mesenteric glands, as casual symptoms may suggest, or its idiopathic nature must be inferred. Admitting that there is some truth in this, it should still be contended, that improved means of diagnosis, and a more intimate acquaintance with the origin and relations of morbid actions, have greatly abridged the number of instances in which no local lesion can be detected; and that, instead of this circumstance being common, it is remarkably rare. It is somewhat singular, that the same author, — M. BROUSSAIS, — who has written so ably against the existence of fever as an essential or idiopathic disease, should have produced, in 1803, a work on hectic fever, in which its idiopathic nature is strenuously contended for, and its various forms very minutely described — the least idiopathic of all fevers having been considered by him chiefly as such; — M. BROUSSAIS had, however, not then changed his opinions as to the nature of fever.

292. i. DESCRIPTION. — The early symptoms of hectic are — emaciation with a pale, and often fair, skin; increased frequency of pulse, especially at noon and evening, with some degree of hardness or sharpness; rapid or short respiration on any exertion; and increased heat of skin. — The exacerbations are at first very slight; but they soon become more evident, particularly in the evening; are preceded by a slight or marked chill; are attended by increased heat, which is most evident in the hands and face, the skin being at first dry; and terminate in a free, profuse perspiration, especially the evening paroxysm, which usually subsides in this manner early in the morning. The bowels are costive, but afterwards readily acted upon; ultimately they are relaxed, and colliquative diarrhoea supervenes. The urine is various, but most frequently pale and without deposit; more rarely high-coloured, and with a lateritious sediment. As the disease advances, the delicate circumscribed bloom on the cheek, which was at first only occasional, is more constant and general, especially during the exacerbations; the throat and fauces are red, dry, and irritable; the tongue is often clean, red, smooth, without papillæ, and glazed, and ultimately, with the lips and fauces, is covered by aphthous exudations; the eyes are sunk in their orbits, from the absorption of adipose matter, but are brilliant and expressive, their whites pearly and clear; the whole frame is emaciated, and the temples excavated; the hair falls out; the ankles and sometimes the legs are cedematous; sleep is unrefreshing, feverish and disturbed; and debility with a sense of lassitude is constant, but the patient's spirits are unbroken or even sanguine. At last the diarrhoea and colliquative sweats become daily more abundant; the respiration short and precipitate; and the debility so

great, that the patient often expires when attempting to speak, or on assuming a sitting posture, &c. During the course of the disease, the sensorial functions preserve their integrity; but sometimes, towards the close, slight delirium occurs. In those cases especially which depend upon organic change in the respiratory organs, there are more or less dyspnoea, cough, and expectoration; the nails become incurvated; the last joints with the extremities of the fingers fusiform, and the expectation of recovery gains strength with the progress of disease. (See TUBERCULAR CONSUMPTION.)

293. MM. BROUSSAIS, FOURNIER, VAIDY, BOISSEAU, COUTANÇEAU, and some other writers, have divided hectic into three stages: the first continuing as long as the appetite and strength are not materially impaired, and the remissions are distinct; the second consisting of a small, quick, and frequent pulse, accelerated during the exacerbations, with debilitating perspirations, burning heat of the palms of the hands and soles of the feet, and rapid emaciation; the third supervening with the colliquative diarrhoea, oedema of the lower extremities, extreme emaciation and prostration of strength.

294. ii. The CAUSES of hectic fever are remarkably diversified. — It most commonly proceeds from suppuration, ulceration, chronic inflammation, excessive action, and irritation of a secreting organ or surface; from caries, necrosis, or structural change of osseous parts; and from slow inflammatory action of any part whatever of the frame. It also attends upon various adventitious and malignant productions. But in all these, it is merely a symptom of the extent to which the constitution is influenced by the local change. M. BROUSSAIS has distinguished several varieties of hectic according to the nature and seat of its principal causes; as, the Gastric, the Pectoral, the Genital, Hemorrhagic, Cutaneous, Moral, &c. HILDENBRAND enumerates the following: the Inflammatory, Putrid, Nervous, Gastric, Atrabilious, Pituitous, Vermineous, Enteromesenteric, and Suppurative, to which may be added the Puerperal. As each of these varieties attaches to itself more or less importance, and as the division adopted by M. BROUSSAIS has been very closely followed by numerous recent writers, I shall offer a few remarks in illustration.

295. a. Gastric Hectic is distinguished by anorexia, thirst, dryness of the mouth, prolonged and difficult digestion, and more or less of the usual concomitants of indigestion, especially eructations, flatulence, acidity, cardialgia, &c. Sometimes the appetite is unimpaired, or even increased, but digestion is faulty. The tongue is loaded, the mouth clammy, and the taste disordered. There are often uneasiness at the stomach, tenderness of the epigastrium, and frontal or sub-orbital cephalalgia. The complaint is exasperated by heating food, and the abuse of stimulants, which occasion a sense of heat in the stomach, or pain and cardialgia, with acrid or acrid eructations. Ultimately the patient becomes pale; the breath foetid; the bowels constipated, irregular, or even irritable; and the symptoms of hectic fully developed. In children, picking at the nose, mucous diarrhoea, and occasionally the expulsion of worms, are also observed, and the disorder is almost identified with, or is merely a

—*a. Inflammatory Hectic* is merely that form of symptomatic fever which usually attends chronic inflammation of an internal viscus, or of a deep-seated part.—*β. Putrid hectic* is the fever sometimes attending scorbutic affections, or gangrenous and spreading ulceration, &c.; or arising from unwholesome and innutritious food.—*γ. Nervous Hectic* is the constitutional disturbance observed in persons labouring under mental afflictions, &c. (§ 300.), or chronic disorder of the nervous system, and in chlorotic and hysterical females.—*δ. Atrabilious Hectic* presents itself in persons long subject to disorder of the liver and other digestive organs—whose portal circulation has become congested or obstructed, their biliary and intestinal secretions morbid, and their digestive canal torpid or overloaded. Such persons are morally and physically depressed; are melancholic and hypochondriacal, sallow, squalid, and thin; are often affected with shortness of breath, colicky pains, disordered bowels, tenesmus, and hæmorrhoids; the stools are dark, foetid, and scybalous, and the abdomen frequently hard or tense.—*ε. Pituitous Hectic* is merely a modification of the gastric (§ 295.), attended by pituitous coluvies in the prima via, owing to imperfect power of the organic nervous system. It is common in children, and is characterised by pallor, leucophlegmatic indolence, and torpor; swollen lymphatic glands, increased secretion of mucus; tumid abdomen; fluor albus; the collection of viscid mucous on the tongue and teeth; coryza, mucous diarrhoea, and obscurely remitting and slight fever.—*ζ. Verminous Hectic* is a modification of the foregoing, or the association with it of worms in the intestinal canal. It is occasionally observed in delicate and relaxed, or rickety, or scrofulous, children; and in those who live in low, damp, close, and unhealthy localities and apartments, and who are subject to chronic bronchitis or winter catarrhs.—*η. The Entero-mesenteric* is a modification of the *pituitous* and *gastric*, particularly when occurring in children; or is rather the association of enlargement of the mesenteric glands with the affection of the digestive mucous surface, chiefly constituting these varieties. It is hence closely allied to the affection already described under the head of *Infantile Remittent* (§ 278.).—(See also art. MESENTERIC DECLINE.)

302. *h.* The varieties of hectic which arise, from the formation of matter in internal viscera, from tuberculous ulceration, from carious bones, &c., from the irritation of foreign substances, and from chronic inflammation affecting parts possessing a deficient power of reparation, possess general features of resemblance, but vary in the more minute details, and differ not materially from the general description given above (§ 292.).

303. *iii.* PROGNOSIS.—The *duration* of hectic varies from a very few weeks to a number of years; but, however long, the tendency of the disease is fatal, unless circumstances occur or medical means be used to arrest its course—unless the causes on which it depends are removed.—The *danger* is owing entirely to these causes, and is great according to their nature.—In cases of caries, or of other local diseases which admit of removal, the fever disappears soon after the separation of the morbid from the healthy parts. When the disease depends upon the continued or repeated irritation of a secreting surface or gland,

as in its *sexual* and *puerperal* varieties (§ 297, 298.), and in the chronic forms of bronchitis and diarrhoea, it generally disappears with the cause which produced it, unless serious disease of some important viscus, as of the lungs, has been superinduced in its course. But when chronic inflammation continues to destroy, or to alter the structure of, some vital organ or deep-seated tissue, or when the substance of an internal viscus is in a state of suppuration, or when hectic proceeds from tuberculous formations, recovery seldom takes place. Yet, in some of these cases, the powers of life continue long to resist the progress of disorganisation; and occasionally at last are successful, not only in limiting it, but also in removing the chief of whatever changes had taken place. This is demonstrated in the adhesions of serous surfaces, in the absorption of purulent collections from the substance of internal viscera, or in their discharge, and in the subsequent cicatrization of the parts affected. Both the liver and lungs furnish proofs, although in rare cases, of such occurrences. Even a lobe of one of the lungs may be entirely destroyed by suppuration, and the patient recover. Where the cause is obscure, and we doubt whether the disorder is idiopathic or the consequence of some lesion that eludes detection, the patient being young, and vital power not far reduced, hopes should be entertained. But when strength is far reduced, emaciation extreme, and colligative diarrhoea or perspiration is present, there is little or no chance of recovery.

304. *iv.* PATHOLOGY.—*A.* The *Lesions, post mortem*, consist—1st, of those which caused the fever (§ 294.);—2d, of alterations of the mucous surface of the digestive canal, upon which the diarrhoea present in the last stage mainly depended;—3d, of disease of the lymphatic and mesenteric glands;—and, 4th, of redness and inflammatory discolouration of the lining membrane of the heart and large vessels.—The various lesions from which this fever may proceed, require no further notice than has been taken of them in other articles; but those which are evidently consequent upon its early stages, which aggravate it in its course, causing the more severe symptoms characterising its latter periods, are deserving of attention.—The changes in the digestive mucous surface consist chiefly of tubercular depositions, and of ulceration seated more especially in the lower part of the ileum and in the cæcum, with softening, and frequently with superficial redness, of the mucous membrane. The ulcers, however, are often unattended by redness, thickening, or unequivocally inflammatory appearances; and are entirely similar to those described in the article DIGESTIVE CANAL (§ 36. *et seq.*). The changes in the absorbent glands are the same as those described in the article LYMPHATICS.

305. The lesions of the circulating system have been overlooked, until notice was directed to them by BOUILLAUD, who has given the details of a number of cases of hectic, in which the internal membrane of the heart, and large vessels, both arterial and venous, presented more or less of inflammatory redness; the substance of the heart itself being often soft and flaccid, and atheromatous depositions being sometimes found in the internal membrane of the arteries.—Several years ago, I observed the internal lining of the pulmonary vein, and of its principal branches, of a

ation; are among the most effectual means of cure. Seltzer water, soda water; the mineral waters of Pyrmont, Carlsbad, of Gielenau, of Ems, of Vichy, of Bath, of Tunbridge, &c., are severally useful, if appropriately prescribed. — When the disease is occasioned by suckling, the cure is generally speedy, if the cause is relinquished before an important organ becomes affected; and if a restorative regimen, with change of air, be adopted. In such cases, the *mistura ferri composita*, and *chalybeate waters*, or the mineral waters just mentioned, are very serviceable.

310. *d.* The treatment of the other varieties of hectic is not materially different from that now stated. — When the disease follows *hæmorrhages*, the means of cure should be directed especially to the pathological state of which the hæmorrhage is the result. (See that article.) — If it be connected with *cutaneous eruptions*, the state of the digestive organs, and of the frame generally, ought to claim an especial notice; and if it originate in *mental emotions*, such measures as are the best calculated to divert the mind from contemplating the sources and relations of its misery should be prescribed. — The *atrabilious*, *pituitous*, and *verminous* varieties require the combination of tonics with warm purgatives (F. 557—563. 572—576.), *chalybeate mineral waters*, and vegetable and mineral deobstruents.

311. *e.* When the *irritation and absorption of morbid matter* are the causes of hectic, their sources should be removed; especially when they consist of carious bones, diseased joints, puriform collections, &c. But when this indication cannot be accomplished, or when the preservation of a limb requires that every means should be tried, the treatment ought to be directed with the view — 1st, of diminishing irritation; and, 2dly, of counteracting or resisting the contaminating influence of the morbid secretion on the circulation. — The first of these is to be fulfilled by a judicious use of opium, morphine, hop, henbane, hemlock, &c.; — the second, by medicines which support vital energy, and thereby resist the extension of disease, or promote the powers of reparation; as digestible nourishment, dry and pure air, gentle tonics, antiseptics, absorbents, and astringents. These may be variously conjoined, according to the peculiarities of the case — anodynes and narcotics with tonics, and tonics with antiseptics and absorbents. Thus, the infusion of cinchona may be prescribed with muriatic acid and the muriate of morphine; the infusion of cascarrilla with the solution of the acetate of ammonia and the acetate of morphine; the tonic infusions or decoctions with the alkaline sub-carbonates, or with the solution of potash, or with the chlorates, and the extract of hop or of hemlock, &c. Camphor may likewise be conjoined with narcotics, in cretaceous and absorbent mixtures. When vascular action becomes much excited, the nitrate of potash, or the muriate of ammonia, may be given with such of the foregoing as are chemically compatible with them; and digitalis or tartarised antimony may be prescribed in the more inflammatory cases, and when the bowels are not irritated.

312. *f.* Various *urgent symptoms* require to be palliated during the advanced progress of the disease. Great *heat of skin* will be relieved, and consequent perspiration diminished, by cold or

tepid sponging the surface with equal parts of spirits, of solution of the acetate of ammonia, and of rose water. — *Restlessness* may be diminished by the anodynes already enumerated, or by prussic acid, combined with gentle tonics and refrigerants. Camphor, henbane, and the nitrate of potash, or muriate of ammonia, are the most generally useful in this state, excepting when the bowels are relaxed, when opium, hop, or the extract of poppy should be substituted. When *diarrhæa* supervenes, the pathological conditions to which I have attributed it (§ 306.) should be kept in view, as a treatment founded upon them is the most successful in practice; — we should endeavour, in these cases especially, to counteract the contaminating influence of morbid secretions upon the circulation, and to impart tone to the digestive mucous surface. The means that are calculated to fulfil these intentions, are also restorative of vital power, enabling it thereby to resist the extension of disease. The tonics and narcotics already mentioned (§ 311.) may be employed with these views; or certain of them may be conjoined with the chlorates of lime, potash, or soda; or with Kréosote; or with cretaceous mixtures; or these latter may be given with the compound tinctures of camphor or of opium; or with tonic and astringent extracts.

313. *g.* The *Diet and Regimen* are most important parts of the treatment of hectic; but they should be varied, or even different, in its different states. In most cases the food should be digestible and moderately nourishing. The milk of asses, or milk warm from the cow, goat's milk or whey, fresh butter-milk, warm milk with one or two tea-spoonfuls of very old rum in it; shell-fish, especially oysters; farinaceous and mucilaginous articles of diet; jellies, particularly those made with Iceland or Carrageen moss; and grapes in considerable quantity; have severally been recommended, and are more or less beneficial, according as they are appropriately prescribed. In most cases, the patient should take very gentle exercise in the open air, when it is mild, and expose himself to the sun and air as much as possible without the contingent risks. In some instances, especially those caused by debilitating discharges, by caries, &c., old wine, especially sherry, port, hermitage, and Burgundy, may be allowed with much benefit; and either old Madeira or sherry may be taken in Seltzer water. It is in such cases, especially, that the mineral waters recommended above (§ 309.) are most serviceable. (See also the articles Abscess (§ 55.), Absorption (§ 15.), Blood (§ 143. et seq.), Mesenteric Decline, Tubercles, Tubercular Consumption, &c.)

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fever varies with the kind and combination of causes producing it. Will infectious typhus communicate simple continued fever, or bilious inflammatory fever, or gastric fever, or climate fever, or epidemic yellow fever; or will these species of continued fever arise from the same cause, and admit of being resolved into grades of intensity merely? No one capable of distinguishing disease ever saw the typhus miasm occasion any of these fevers, nor the causes usually giving rise to either of them produce typhus. Neither of them is convertible into the other; and however closely allied or equally severe certain varieties of each may be, something more than difference in intensity is to be recognised. The causes of each are distinct, the features of each different, the course and duration different, the external appearance and internal lesions different, and yet no difference as to severity or intensity may often be ascertained by the ablest pathologist. Is it to this assumed difference of intensity merely that we are to impute the admitted fact, that, in the very same period or stage, the treatment which is beneficial in the one fever is death in the other,—that large depletions are required at the commencement of one species, and most injurious at the same period of another? The very varied, and even opposite, treatment required in several epidemics, even when the same organs are prominently affected, cannot be referred to grades of severity; for fevers, even of this climate, may be equally violent or severe, and terminate fatally after the same duration, and yet be aggravated, or ameliorated, by opposite measures. The great pathological truth,—which ought never to be overlooked, and without a full recognition of which, in estimating the nature and treatment of fevers, our experience will be worse than useless—will be deceptive, and our knowledge worthless empiricism,—namely, that the vital manifestations may, all or severally, be variously affected by the causes productive of fever—may be lowered or heightened, or otherwise changed; and that these changes, whether as to *kind* or as to *degree*, should be made the basis of distinction, in arranging the varieties and forms of fever, and in devising indications for their cure. In the following inquiry, something more than intensity of action will be recognised and made the grounds of arrangement and treatment, inasmuch as each of the several kinds of fever presents characters having stricter reference to the nature, than to the grade, of disorder—to the state of vital manifestation in the several systems and structures, and to the seat and grouping of the predominant lesions, much more than than intensity of morbid affection. The arrangement, therefore, about to be followed, will not materially differ from the sketch already given (§ 44.). But all the kinds of fever there enumerated cannot be treated of under this head; their importance, and, still more, certain peculiarities of character, as well as of the circumstances in which they occur, requiring, conformably with the form of this work, that they should be discussed in separate articles. In considering, therefore, the various kinds of continued fever, those only which are most intimately related to each other will be comprised under this head; the more simple states being first described, and the more complicated and dangerous forms successively reviewed.

318. ii. *Of the Prognostic Symptoms in Continued Fevers.*—*a. The countenance.*—When the expression is serene, confident, clear, and animated, the disease is of a mild and uncomplicated kind; in the advanced stages this state indicates a favourable crisis. If the face is large, injected of a crimson or dark colour, with prominence of the eyes, or is agitated and anxious in the early stages of fever, the morbid excitement and determination to the head occasioning this appearance will speedily exhaust the powers of life, and, in a later period, will soon be followed by malignant symptoms, or fatal collapse. When the countenance is tinged of a yellowish or earthy hue, or is withered-like or sunk, or constricted, and especially if it exhibit distress, or want of serenity and confidence, extreme danger may be apprehended. A full, bloated, waxy, or livid countenance, particularly if it assume a tawny or mahogany tinge, indicates very dangerous congestion and approaching death.

319. *b. External surface.*—If the skin be soft and perfect in its sensibility, its heat not excessive, although augmented, but without a feeling of pungency or burning; and if its temperature be equally diffused; a mild attack may be expected. But when the skin is dry and harsh, or thickened, and the heat is ardent, caustic, or unnatural; if the surface be little sensible, not readily acted upon by rubefacients or blisters, or if vesicated parts assume a dark or black hue; if the heat be ardent in the head or trunk, particularly at the epigastrium, and lowered in the extremities; if the skin be thickened, apparently withered, dusky, dark, or livid in parts, or yellowish, flaccid, tawny, streaked of different shades, lurid, or otherwise changed from its natural hue; if it be damp, greasy, puffy, or bloated, or studded with very dark petechiæ, vibices, or blotches, or unusual eruptions; or if parts pressed upon show any tendency to gangrene; great depression of the vital powers, with contamination of the circulating fluids, should be inferred, and the danger considered great. The more florid, however, the spots are, the less is to be feared; and when the black or violet petechiæ assume a brighter tint, a more favourable opinion may be formed. Large black or livid spots are often attended by dangerous hæmorrhage from the bowels. Small dusky brown spots, like freckles, are very unfavourable signs. Large livid or dark greenish marks seldom appear till very near the fatal period. (HUXHAM.)—If the skin be covered by warm, general, fluid and copious perspiration, attended by an open or free pulse, a favourable issue may be expected. But, if the perspiration be cold, clammy, scanty, or partial, with a nauseous or disagreeable odour, especially if the pulse be weak, small, very frequent, oppressed, or irregular, there is much danger. The occurrence of erysipelatous or erythematic inflammation in the seat of sores or of abrasions; the breaking out of old ulcers, or the opening of cicatrices; or a foul, gangrenous state of old sores; denote sinking of the powers of life, and a tendency to a dissolution of the textures.—*Emaciation*, when moderate, and in due relation to the duration of the disease, is rather favourable; but, when it is excessive or rapid, it indicates ulceration in the bowels. Little or no wasting, or a bloated and a soft or tumid state of the surface, is very un-

danger present. Indifference to death, with an apparent desire of it, and a firm persuasion of being perfectly well, are also unfavourable.

324. *g.* If the eyes be calm, or slightly animated, in the early stages, a mild form of fever may be expected,—at advanced periods, a favourable change has commenced. Agitated, wild, terrified, confused, muddy, painful, prominent, turgid, or suffused eyes, indicate a most severe disease, at an early stage, and great danger in advanced periods, especially if the whites of the eyes become of a dusky or dirty yellow. Intolerance of light attends cerebral excitement; and rolling of the eyes, with a wild, unfixed stare, often precedes severe delirium or convulsions. A dull, sluggish state of the eyes, want of animation, sinking in their sockets, a dark hue of the conjunctiva, with a sad expression, are unfavourable. A pearly whiteness, with agitation and prominence, is a symptom of dangerous congestion of the lungs and liver; and, if succeeded by a dirty yellow hue, or dulness of the cornea, indicates approaching dissolution. Partial paralysis of the retina, indicated by black spots, or other dark objects floating before the eyes; closure or falling of the upper eyelid, or dosing with the eyelids half closed; are dangerous symptoms. — Slight deafness, without pain in the ears, is not an unfavourable sign.

325. *h.* The tongue and mouth furnish important indications in fevers. — In the course of the milder forms the tongue is foul, coated with a yellowish or cream-coloured mucus, and generally furred; it is sometimes a little red at the sides and apex, and rather dry, or moderately moist, in the centre. In proportion as it departs from these states, the danger is increased. If it be covered by a milky, whitish, or mealy coating, and if it be also large, flabby, or swollen, early in fever, an adynamic or malignant state of disease may be expected. If it become rough, dark-coloured, with prominent papillæ, and not particularly coated, but dark red, especially towards the sides, serious affection of the alimentary canal, or of the liver, should be feared; more especially if the symptoms referrible to the abdomen and these viscera be also urgent. If to these appearances be super-added dryness, and contraction of its breadth, serious or fatal changes within the head, or large cavities, have supervened. When the tongue is white, or coated with the papillæ, erect or excited, and the edges red and fiery, vascular action is then inordinate in some internal organ, although no other symptom may indicate this state; and vascular depletions are required. If it be covered by a deep yellow coating, congestions of bile in the biliary ducts and gall bladder are evinced; and if this pass quickly into an excited, dry, and brownish state, the supervention of congestion, or inflammatory action in the substance of the liver, or the digestive mucous surface, or in both, with diminished vital power, may be inferred. A dark or brick-coloured, or livid redness of the tongue, with a glossy surface, or a surface partially covered by a partly detached coating, or black crust, or with a dark, scanty, tenacious mucus in the mouth, or on the teeth, or lips, show extreme prostration of vital power, with contamination of the circulating and secreted fluids. A leaden-coloured, sodden, or parboiled-

like, flaccid, smooth, enlarged, tremulous, or diminished or shrunk, tongue, are all unfavourable signs. If this organ become, in the progress of fever, thickly covered by a dark or fuliginous coating, or exhibit, in addition, deep fissures, the apex and sides being of a brownish or dark hue, the adynamic state is extreme, and the digestive mucous surface will readily pass into ulceration or sphacelation, if, indeed, the former lesion have not already commenced. — Vital exhaustion, contamination of the fluids, and solution of the soft solids — the constituents of marked malignancy — are evidently present, if the gums readily bleed when touched, if they and the teeth are covered with a black viscid mucus; if the former discharge a dark dissolved blood, or ichorous bloody sanies; or if a similar fluid escape from the nostrils or posterior fauces. An inky state of the surface of the tongue sometimes ushers in these symptoms, and also evinces the malignant condition. On the other hand, if the tongue becomes cleaner at its edges or apex, or moister round the margin, particularly if other favourable signs appear, a salutary change has commenced.

326. *i.* Thirst is often very urgent, or even insatiable; but, although indicating the intensity of disease, it is not of itself a dangerous symptom. — The absence of thirst, especially when the tongue and fauces are dry, rough, and parched, is always an unfavourable sign. A constant desire of drink, yet the patient drinking little when it is given him, and a difficulty of deglutition, are very dangerous symptoms.

327. *k.* The evacuations from the bowels furnish important signs to guide the practitioner in the treatment and prognosis. — In the milder forms of fever the bowels are readily acted upon, and the evacuations are generally feculent, but varying in colour and consistence, according to the state of the biliary and other secretions, and the purgatives employed. When the stools give relief from uneasiness in the abdomen, or reduce fulness of it, a mild disease may be expected. If the most active cathartics are required to produce evacuation, the stools being watery, scanty, or otherwise morbid, and voided with a sense of confinement or difficulty, the abdomen being full, or tense, or hot and uneasy, a severe fever may be anticipated, and general or local depletions, or both, are indicated. If copious feculent stools follow this state, a favourable crisis may be looked for. Frequent, scanty, bilious evacuations, presenting every variety of colour, from a light green, or greenish yellow, to a greenish black, sometimes watery, at other times mucous and streaked with blood, occasionally feculent and extremely offensive, often accompany the worst forms of bilious or autumnal fevers, and indicate danger, particularly if they assume a pitchy appearance. When the stools are smooth, dark brown, or blackish, like treacle, the danger is great. When they are intimately mixed with blood, or bloody sanies, or purulent mucus, or are ochrey, very frequent and exhausting, organic changes in the mucous surface of the intestines, or in the liver, are evinced. If discharges of blood are found in the stools, especially if unmixed with other matters, ulceration in the large bowels may be inferred. If the

action of the causes ; — 2dly, to the less rigidity of their fibres ; — and 3dly, to the periodic discharges to which they are subject.

XVII. FEVER, ARDENT; *Febris Ardens*. CHARACT.

— *The stages or series of febrile phenomena proceeding with rapidity and regularity ; the period of excitement being very acute, and attended by greatly increased vascular action ; no morbid seminum or infectious miasm being generated in their course, as observed in modern times.*

336. Under the generic denomination of *Ardent Fever* may be comprised those more acute forms of fever which are attended by great vascular excitement, and which, owing to their nature and severity, generally run their course in from one to fourteen days, and are but seldom prolonged beyond nine or eleven days. They may be divided into the more ephemeral and the inflammatory.

i. EPHEMERAL FEVER. SYN. — *Diary Fever, Febricula, Ephemera, Febris diaria*, Auct. Var. ; *Simple Fever*, FORDYCE ; *Das eintägige Fieber*, Germ. ; *Fièvre éphémère*, Fr. ; *Effimero*, Ital. ; *Efemera*, Span.

337. CHARACT. — *Increased frequency and strength of pulse ; with heat of skin, headache, thirst, and white excited tongue ; terminating in perspiration generally within twenty-four hours.*

338. *Simple Ephemeral Fever* may occur in a very mild and slight form, — the *Ephemera mitis* of Dr. GOOD ; or in a much more acute state, — the *E. acuta* of this writer. But intermediate grades between these may also present themselves.

339. A. Causes. — *The mildest variety* is usually caused by excessive or prolonged muscular exertions ; by the more violent passions and emotions of the mind ; by protracted study and mental occupations or excitements ; by vicissitudes of temperature, and exposure to a warm sun ; and by disorder of the digestive organs, proceeding generally from the quantity and nature of the ingesta. — *The more acute states* usually arise from the above causes, from a surfeit, from temporary obstruction or congestion of the biliary organs, from the presence of fecal collections and morbid excretions in the prima via, and from violent exercise under a hot sun.

340. B. Symptoms. — a. *The milder form* of ephemeral fever is rarely preceded by chilliness or rigors ; but it generally commences with lassitude, yawning, stretchings, and a sense of irritation or of undue excitement. The pulse becomes frequent, the skin hot, and the head pained. The patient tosses in bed — is restless ; cannot sleep, or sleeps in a very disturbed and interrupted manner ; and his tongue and mouth are dry. These symptoms frequently commence in the afternoon or evening, and subside, in the course of the succeeding morning, in a gentle perspiration ; thus terminating in from eight to fourteen hours. But often, also, when the cause has been more severe, and the disorder has come on at a later hour, the patient continues feverish in the morning after a restless night ; is indisposed to leave his bed ; feels unrefreshed, and unable to make any exertion ; and passes the day in disquiet. Towards evening, the restlessness and other febrile symptoms increase ; but in the night, or at an early hour in the morning, he falls into a quiet sleep ; a perspiration breaks out ; and he awakens refreshed and restored.

341. b. *The more acute form* often begins — especially when it is caused by disorder of the digestive organs, or by cold — with chilliness or rigors, succeeded by great heat of skin and throbbing pain of the head. The pulse is frequent, strong, and full ; the face is flushed ; the urine high-coloured ; the tongue is white, the papillae erect ; and the secretions and excretions are diminished. These, and the usually attendant symptoms — as restlessness, languor, want of sleep, and general uneasiness — having continued from twelve to twenty-four hours, a free perspiration supervenes, generally towards morning ; the urine deposits a sediment ; and the disorder disappears. When this form of fever proceeds from mental emotions or excitement, and from exposure to a hot sun, or from muscular exertions in warm weather, or from a rapid transition to a hot climate, it is seldom or never preceded by chills or rigors, and, if not actively treated by antiphlogistic remedies, is often prolonged beyond the period just mentioned, and assumes all the characters of the next species — *Inflammatory Fever*.

342. C. Diagnosis. — These states of disorder may be mistaken for the commencement of some one of the more serious forms of fever. But they may readily be distinguished by ascertaining their causes ; by the absence of the usual premonitory signs of fever ; by the sthenic and acute vascular excitement, nervous energy being very little impaired ; by the rapid increase of the heart's action ; by the slight depression of the muscular powers ; and by the circumstance of pain being either hardly complained of in the loins and limbs, or altogether absent.

343. D. Treatment. — The febrile symptoms soon subside after the digestive canal is freely evacuated, especially when they have arisen from the irritation produced by retained excretions. When they are caused by the ingesta, an emetic should be given immediately, and its operation promoted by the usual means ; but it is contra-indicated in all other cases. Afterwards a dose of calomel ought to be administered, and allowed to act upon the secretions for five or six hours. Cooling saline purgatives, conjoined with small doses of antimony, or of ipecacuanha, as advised by VATER and GIANELLA, or of the spirits of MINDERER, repeated at short intervals, will then hasten recovery, and remove the morbid secretions which have disposed the frame to these febrile attacks. — When the disorder has been occasioned chiefly by atmospheric vicissitudes, diaphoretics, especially after the bowels have been freely evacuated, and a tepid or warm bath, are more particularly indicated.

344. If the febrile attack have been caused by inordinate mental excitement and exertion, or by fits of passion, by anxiety or other affections of mind, cold should be applied to the head, in the form either of affusion, of cold water, cold sponging, evaporating lotions, &c. ; the bowels freely evacuated, and diaphoretics prescribed. — If it be produced by exposure to, or by muscular exertions under, a hot sun, and whenever vascular action is excessive, or the patient plethoric, full bloodletting ought to be practised previously to the last specified means, which should be assiduously employed, and accompanied by cold sponging of the surface, and the internal use of refringerants and saline medi-

gration to warm climates, are—their early age, plethoric habits, and phlogistic diathesis; inattention to their bowels during the passage, and their use of salt provisions and spirituous or vinous liquors; increased intemperance, and incautious exposure to the sun and to the night air; excessive fatigue, or alternations of indolence and great exertion; and suppressed perspiration. Dr. JACKSON remarks that persons thus circumstanced rarely escape an attack of fever during the first year of their residence in a tropical country; and that the fevers that occur from these causes are often of the most aggravated kind, and rapid in their course, more especially among troops crowded in barracks or transport ships, where the heat of the climate is augmented artificially; the excess of heat influencing the febrile form, increasing the violence of the symptoms, and retarding the progress of recovery.

350. A question has arisen, as to whether or not the inflammatory states of fever in warm countries are caused by malaria, or by the other causes now instanced. There can be no doubt that malaria very frequently produces, in the plethoric, young, and robust, who have recently arrived in a hot climate, fever of an inflammatory and continued kind. But it must also be conceded that this fever chiefly occurs, even in persons thus constituted, during the dry season, and at times and in places where the existence of malaria is doubtful, or, at least, by no means proved. It is notoriously admitted that the inflammatory states of continued fever, in both the East and West Indies, appear among those soldiers, sailors, and civilians, who have not been long in a warm country, and who have not suffered from disease since their arrival; and that they take place chiefly during the dry and warm seasons, and in situations where the usual effects of malaria are never observed. This is the result of the experience of JACKSON, ANNESLEY, BOYLE, TWINING, CONWELL, and of other experienced practitioners in warm countries. It agrees with my own observations; and is even admitted by Dr. FERGUSON, who has gone much further than any one else in assigning malaria as the cause of intertropical fevers. I believe that the other causes assigned above (§ 346–348.) will, in these countries especially, produce fever of an inflammatory or bilio-inflammatory kind, in unacclimated Europeans; but that, when those causes are not associated with malaria, the fever resulting from them will generally subside, under judicious treatment, without evincing those dangerous symptoms which characterise fevers proceeding chiefly from terrestrial exhalations. Although some of the causes, especially those which relate to atmospheric temperature and climate, are very different as to their nature and action, yet they are mainly instrumental in producing fevers having many common features, but differing in severity and duration.

351. B. FORMS.—a. MILD INFLAMMATORY FEVER.—a. The fever which usually arises from cold and dry states of the air, in cold climates, in elevated situations, or in temperate countries, from atmospheric vicissitudes or other causes, assumes either *simple* or *complicated* forms, and is generally sporadic. Its epidemic occurrence is comparatively rare, especially in its simple state. It appears chiefly during winter and spring, or during north and north-east winds. In its com-

plicated states, which are most frequent, it forms a connecting link between idiopathic fever, and visceral inflammation; the local affection appearing in the early or advanced course of the former, the general disorder, or symptomatic fever, being consequent upon the latter. Thus inflammatory fever, and local inflammation, arise most frequently from the same causes acting upon different constitutions, habits of body, and states of local or general predisposition;—the simple form of inflammatory fever appearing in the young, plethoric, and robust, and in those possessed of no local predisposition; the complicated form taking place in persons whose previous ailments, habits of life, or avocations, have induced a disposition to predominant action in some important viscus, or from a concurrence or succession of external causes tending to the more especial disorder of one or more organs; and the primary local inflammation occurring from a predisposition of some part so great as to experience the onus of morbid action from the commencement, or soon after the impression of the exciting causes, or from the kind and concurrence of these causes.—In the *first* case, the whole frame seems to participate equally in the disordered action from the beginning: in the *second*, the disorder is also general from the first, with predominance of it evinced in some organ, either at a very early period, or in some advanced stage: in the *third*, the earliest symptoms of disease are referred to a particular viscus, and with the increase of such disease the whole system sympathises.

352. β. The *symptoms* of this variety are uniform in kind, but vary in severity. The premonitory signs are usually slight, or of brief duration. Hence the attack seems sudden, and is commonly ushered in with rigors or chills which are of short continuance; and, although often well marked, are occasionally so slight as to escape observation or recollection. The rigors or chills seldom recur, and are rapidly followed by general vascular reaction: the skin and integuments become full, injected, dry, hot, and burning; the countenance full glowing or red, and animated; the eyes injected, intolerant of light, but lively; the pulse frequent, strong, bounding, and full, sometimes hard or oppressed; respiration is frequent, and the expired air hot; the nostrils and mouth are dry; the tongue white, its papillæ excited or erect; and the lips full and red. The external appearance of the body evinces increased vital action; the whole surface appears glowing and animated; the internal sensations indicate generally increased vascular activity; and all the secretions and excretions are diminished or obstructed. The patient complains of great thirst and heat; of a severe or throbbing headache and vertigo; of anxiety at the præcordia; of increased sensibility, especially in respect of light and noise; of restlessness, watchfulness, and of frightful dreams; and of nausea or sickness. Taste and smell, owing to imperfect secretion on the surface of the organs, are impaired or abolished. The pulse seldom reaches 110 beats in a minute: and the heat of skin, although greatly increased, is in due relation with the activity of the circulation; and does not impart the harsh and unpleasant sensation to the hand of the observer, that characterises the more

the symptoms characteristic of either will direct attention to the complication. The stethoscope should therefore be employed whenever the breathing is laboured or oppressed in the inflammatory states of fever observed in the circumstances just stated. — This fever may present also *prominent Hepatic, Gastric, and Enteric disease*; but, in such cases, it will very nearly resemble the forms of fever described under the names *gastro-bilious* and *mucous*.

359. *b. SEVERE INFLAMMATORY FEVER.*—The disease described by the names of *Synochus Causoides*, by GILBERT; of *Synocha Causodes*, by MANGET; of *Synocha Ardens*, by SAUVAGES; of *Endemial Causus*, by MOSLEY; of *Inflammatory Endemic*, by DICKENSON; of *Climate or Seasoning Fever*, by several writers; and of *Endemic Yellow Fever*, by others; differs from the foregoing or mild form of inflammatory fever (§ 351.) only in grade, as insisted on by JACKSON, and proved by my own observation. This is the disease which most frequently attacks new comers into the West Indies, more especially sailors and soldiers; and which has, as already stated (§ 244—247.), been confounded by recent writers with the aggravated forms of bilious fever on the one hand, and with epidemic or pestilential yellow fever on the other. It was also prevalent during the last war among the British troops and sailors in the Mediterranean; and was described by BURNETT, IRVINE, BOYLE, BRUNTON, DOWN, and others; but it generally assumed a milder form than in the West Indies.

360. Whilst the milder form of inflammatory fever is common among the white and assimilated European population of warm climates, the *severe* or *aggravated form* occurs among those who have more recently arrived in them, and more especially among the young, the intemperate, the robust and plethoric, and those who are exposed to the sun, to very high temperature, and to the night air. In most warm climates terrestrial exhalations are also frequently more or less concerned in the causation of the continued as well as of the remittent types of fever: the type being determined, as shown above (§ 43.), by the nature, intensity, and combination of the causes; and by circumstances peculiar to the patient, particularly the novel, or the habitual, operation of the endemic influences to which he is exposed. But, although malaria may be a concurrent cause of this fever, especially in respect of persons who have recently arrived in the West Indies, yet I believe that, where its operation is most unequivocal, the kind of fever produced by it is different from this,—premonitory and cold stages preceding reaction, which is much less violent than in this, the resulting fever being of the bilious continued form, about to be noticed. — My experience fully accords with the observation of Dr. STEVENS, that, when a young Northern stranger is subjected soon after his arrival in the West Indies to the higher ranges of temperature, his clothes are soon drenched; and that, if he be exposed to a current of air in this state, the cold produced will constrict the vessels of the skin, and prove the exciting cause of fever, which, in favourable circumstances, will often be the mild form of inflammatory fever such as has been described above, and as is often observed in temperate climates. The causes which produce a severe affection in young and plethoric strangers, seldom affect the older residents, and

never the natives of the country or the dark races. Women and children, the aged, and the weakly, are much less liable to it than the robust and plethoric.

361. *a.* The history of this form of fever has not been given with the requisite precision by the various writers on it; most of them having mixed it up, in their descriptions, with the inflammatory varieties of remittent, and with the more continued states of fever produced by terrestrial or vegeto-animal exhalations, concomitantly with the other causes of intertropical fevers. — The aggravated form of inflammatory fever is seldom preceded by very marked premonitory symptoms. The attack is usually sudden. Giddiness, faintness, and general uneasiness, sometimes, however, precede it for ten or twelve hours.* There is, occasionally, a slight and brief chilliness at the commencement, especially in the less violent cases, rapidly followed by a sense of universal heat; by flushed face, frontal headache, and vertigo; by inflamed, heavy eyes, and great sensibility to light and sound; by pain in the occiput, neck, back, and limbs; and by a strong, full, hard, and accelerated pulse. A sense of heat, oppression, pain, or anxiety, is felt at the præcordia, sometimes with a dry cough, and pain in the side; respiration is quick, laborious, suspirious, or anxious; the tongue is white, excited, and its edges red; the fauces are arid, thirst urgent, and skin hot and dry; the urine is scanty, the bowels costive; and there is generally nausea, but seldom vomiting until some time after the attack. If the disease be not mitigated by treatment, the patient becomes extremely restless; the headache is rending and intense; vascular action is excessive; and the heat very great. Vomiting now supervenes, and follows the ingestion of whatever is taken to allay the urgency of thirst. The matters thrown off are

* Dr. MOSLEY states that there is a small degree of chilliness and horror, but never a rigor. Dr. JACKSON remarks that there is more or less of horror and shivering, but the cold is rarely great: Mr. DICKENSON, that there is increased excitement from the commencement, and that a slight chilliness at the onset is observed only in the slighter cases (§ 351.). Dr. STEVENS observes in several places, that there is no cold stage at the beginning; and Dr. BRUNTON, that languor, debility, and oppression are complained of, with chilliness. — This discrepancy is the account of the commencement of a most dangerous disease, and on a point so necessary to a knowledge of its pathology, may be in some measure explained. Dr. JACKSON has described this form of fever in connection with the more inflammatory states of remittent, from which it is perfectly distinct. The description of the other writers is more correct; for in several cases, in which I had an opportunity of observing the commencement of the disorder, no rigors, and hardly any chills, were remarked. Even some of those who complained of chills presented a warmer state of skin than natural. The pure climate fever I, therefore, infer does not commence with shivering or rigors; and seldom with chilliness, unless currents of air, cold, &c. have been concerned in causing it by suddenly checking the perspiration. But the continued fever attended with high vascular action, arising from malaria and atmospherical heat and vicissitudes, that is frequently met with in warm climates and in hot seasons, is commonly preceded by manifest premonitory symptoms, and by a cold stage. These two diseases, which frequently resemble each other very closely, have been generally confounded with one another, more especially as they are observed in the West Indies. Nor should this be a matter of surprise, inasmuch as that very many of the instances of fever which present themselves in men in the public services, as well as in civil life, arise from a combination of malaria with climatorial influences, and that the cases which are produced by a concurrence of such causes are perhaps more numerous than those which spring from either alone — from marsh exhalations on the one hand, or from high temperature and its vicissitudes on the other.

important viscera, but it is not actual inflammation — at least, suppuration is never observed in dissection of fatal cases. (For *Diagnosis*, see § 243—247.; and *YELLOW FEVER*.)

368. *s. Terminations and Prognosis.*—(a) Ardent or severe inflammatory fever, if not arrested by an early and energetic antiphlogistic treatment, rapidly terminates in exhaustion of vital power, with alteration of the blood, and organic change of the internal viscera, manifested especially in certain tissues.—1st. A resolution or subsidence of the excited action, without the supervention of the stage of collapse or exhaustion, seldom occurs, unless an appropriate treatment has been adopted. When the period of excitement is early and duly moderated, the severe symptoms of exhaustion either do not appear, or are very slight, debility of short duration being only present; and the patient rapidly recovers without any visceral disease. The stage of exhaustion is great in proportion to the violence of excitement, and in it the more unfavourable terminations occur.—2d. Organic change of some important organ may supervene during excitement, but rarely to an extent sufficient to produce death: it consists chiefly of vascular injection; discolouration and softening of parts; effusion of serum, lymph, or blood; and takes place most frequently within the head, and in the digestive organs. Purulent matter is never formed in this period, nor subsequently.

369. (b) In the stage of collapse, several changes occur; but death is owing rather to their conjoint influence, than to either singly.—1st. Exhaustion of vital power is always present, but not to an extent sufficient of itself to arrest the organic functions.—2d. Deterioration or change of the blood obviously takes place, and is shown by the state of this fluid both during life and after death; but the nature of this change is not fully ascertained; whatever may be its nature, it is merely consequent upon the altered state of organic nervous influence.—3d. It is very probable that exhaustion of this influence, and the resulting changes in the blood, so affect the irritability and tonicity of fibrous and contractile structures as to impair these vital manifestations, and thereby to favour or even to induce the alterations observed towards a fatal close, particularly those affecting the capillary system and mucous tissues; for the vital tone of the extreme vessels and of the digestive mucous surface being thus impaired, and the blood being more fluid and dissolved, as well as otherwise altered, hæmorrhage readily occurs, with discolouration of the skin and of membranous parts; the blotches, &c. observed during the latter stages, proceeding from these pathological states. That the head should appear to suffer especially during the period of excitement, is a necessary consequence of the physical relations of this part, in connection with general vascular excitement; and that the stomach and digestive mucous surface should evince predominant disorder at an advanced stage, may be ascribed to the irruption of acrid or vitiated secretions, particularly the biliary, to the state of organic nervous power, and to the changes induced in the blood.

370. *ζ. The Prognosis* entirely depends upon the period at which the disease is subjected to appropriate treatment, and upon the violence of the seizure.—When the stage of excitement has but recently commenced, the treatment about to be

recommended will generally arrest the disease; but the nearer this stage approaches its acme, or that of exhaustion, the greater is the danger, as those changes in the organic nervous influence, in the blood, and in the vital tonicity of contractile parts, may be considered as having begun; and active depletions are then not so well endured, nor productive of the same effects, as at an earlier period. When symptoms of collapse appear, the danger is very great; and in proportion to the progress of this stage and the urgency of its characteristic phenomena, particularly discolouration of the skin, black vomit, and passive hæmorrhages, it becomes extreme; recovery seldom taking place when these symptoms are fully developed.—When the cerebral affection is very remarkable at an early stage, the danger is then great, as the effects of the treatment imperatively required, conjointly with the exhaustion consequent upon excessive action, will induce a state, which, although much less dangerous than that which would indubitably follow unrestrained action, is still attended by much risk, and often requires the prudent exhibition of restoratives, &c.

371. *The Duration* of this fever varies from two to six or seven days. A fatal termination commonly takes place on the fourth or fifth day.—On examination, *post mortem*, more or less evidence of increased vascular action, often amounting to inflammation, or its consequences, is observed in the membranes of the brain, in the internal surface of the stomach and bowels, and more rarely in the pleura and serous membranes of the abdomen. The digestive mucous surface is studded with numerous dark or ecchymosed spots, from which a fluid black blood seems to ooze. The liver is frequently congested, sometimes larger and softer than natural, and of a dark colour, owing to the quantity of black blood in its vessels. The spleen is somewhat enlarged, soft, and friable; and the omentum injected.—The serous as well as the mucous surfaces, especially in the abdominal cavity, often present livid or dark patches. The blood is every where fluid, black, and dissolved. The internal surface of the heart and large vessels, both arteries and veins, was of a dark red or livid tint in a few cases which I examined; but this point requires further investigation, as my opportunities were not sufficient for the satisfactory examination of it in respect of the universality of its occurrence, and the exact changes on which this appearance depends.

372. *C. Nature of the Disease.*—Fever produced by paludal miasms, or by infectious emanations from living or dead animal matter, are universally preceded by well-marked symptoms, characteristic of the stages of *premonition* (§ 33.) and of *invasion* (§ 35.). But inflammatory fever, especially in its more severe form, is seldom preceded by more than chills, and cold, or other causes which suddenly arrest the cutaneous excretions, have been concerned in producing it. In these fevers, a poisonous agent has infected the frame, and more or less depressed its vital energies, particularly as they are manifested in the organic nervous system; vascular reaction being consequent upon such depression, as shown above (§ 95, 96.). But in this fever, the injurious agent, or primary pathological change, is generated within the system from the action of new and unwanted ac-

fluences, generally climatorial or atmospheric. That this agent is not of a depressing kind, as respects its primary operation, is manifest, from the general absence, at the commencement of the disease, of those phenomena which indicate this kind of action. That it is of an irritating or exciting kind, may be inferred, not merely from the character of the invading symptoms, but also from the changes primarily induced by the remote causes. — If we inquire into the nature of these changes, we shall find them — 1st, As respects the *mild inflammatory fevers* of cold or temperate climates, to consist — (a) of the organic and nervous excitement consequent upon the rapid and increased oxygenation of the blood during cold and dry states of the air, probably aided by the accumulations of the electro-motive agencies in the system which these states manifestly favour; — (b) of the super-abundance of irritating matters in the circulating fluids resulting from casual interruptions to one or more of the eliminating or depurating processes constantly going on in the animal economy; — (c) of the combination of these circumstances or primary pathological conditions. If we grant that the former of these obtains, it is very obvious that the occurrence of the latter will further excite and increase it; even a susceptibility to the former, as marked by high irritability of fibre, may be readily kindled into morbidly increased action, by causes of irritation which may have accumulated either within the vessels — in the blood itself; or external to them — in excreting organs and surfaces. These pathological states are the obvious results of concurrent causes, which primarily excite the sensible and susceptible parts of the frame, and which retard or prevent the discharge of irritating materials from the vital currents which supply and sustain these parts; the accumulation of these materials either increasing the excitement, or giving rise to it. It must necessarily follow that the excitation thus induced will exhaust itself to a degree, and with a rapidity, co-ordinate with its intensity, and thereby induce the phenomena characterising the advanced periods of the disease, which are especially remarkable in the severe or climate fever of warm countries.

373. 2d. As respects the *severe inflammatory or climate fever*, the procession of phenomena must necessarily be different, as it generally arises from causes different, or even opposite, to those just instanced — from a very high temperature, often conjoined with rich, nutritious, and heating food, stimulating drinks, and suppressed perspiration. Either of these is alone sufficient to induce the disease; but, when they co-operate, the effect is more certain and severe. They all act in a similar manner; — they excite the organic nervous system inordinately; increase the actions of the liver, and irritate its vessels; alter the constitution of the blood, causing it to abound with stimulating and injurious materials; and render the secretions and excretions acrid or morbidly exciting. Thus the most violent states of this fever often proceed directly from these causes, without any evidence of primary subaction or a cold stage, unless depressing agents, such as cold, human effluvia, or malaria, concur with them in producing disease; in which case the consequent fever will present features modified accordingly. If cold act upon persons who are under the influence of these ex-

citing causes, a slightly cold stage will often be directly induced thereby. If animal or vegetable miasms concur with them, the fever will present adynamic or malignant characters in proportion to the activity of either of these agents. But when the above direct causes of excitement act solely or principally, their influence upon the organic nervous system is very energetically expressed, and manifested throughout the vascular system, especially that of the brain, liver, and digestive mucous surface. Thus, inflammatory fever differs from the other varieties of idiopathic fever — 1st, in its proceeding from causes, the primary action of which is exciting or irritating; 2d, in excitement or irritation being more or less evinced by it from the commencement.

374. Of the changes that take place in the advanced period of the disease, the most remarkable are those affecting the blood, and the digestive organs. As the stage of excitement merges into that of exhaustion, the *blood* changes from a florid to a dark colour; loses its property of separating into crassamentum and serum, and of firmly coagulating; becomes more fluid; and seems deprived of much of its fibrinous and albuminous constituents. (See art. *BLOOD*, § 128.) According to Dr. STEVENS, its saline ingredients are also greatly diminished. The chief cause of these alterations is evidently exhausted organic, nervous, or vital power; and this is further evinced by a loss of the tone of the extreme vessels, and of the irritability of the moving fibre, always co-ordinately observed in cases presenting this change in the blood. Among the most striking consequences of exhaustion of vital power, as thus manifested in the extreme vessels and blood, are, discolouration of the skin, and passive hæmorrhages from mucous surfaces — phenomena characterising the last stage of the most unfavourable cases of the intense disease. The gastric disturbance in the early stages generally proceeds from excited vascular action, and from the passage of irritating secretions into the stomach, in connection with an increased susceptibility and irritability of the organ. In the latter stages, it more especially results from the morbid secretions poured into the stomach, and the irritated or inflamed state of its villous surface.

375. The source of the black matter passed from the stomach and bowels in the last stage of this and of other severe fevers of warm countries, has been variously stated. Some consider the black colour to proceed from the exudation of dark blood, which, in mixing with the secretions of the stomach, liver, and bowels, imparts to them a still darker tint. Some ascribe it chiefly to the bile, and secretions from the digestive mucous follicles, which are often both very dark and thick, in the last stage of the more malignant kinds of intertropical fevers; and others believe it to arise both ways. There is no doubt that all the secretions poured into the digestive canal are more or less diseased, particularly in the latter stages: but it is as clear, that the black colour mainly depends upon the state of the blood; and that all the matter ejected upwards and downwards, presenting this appearance, does not consist of altered secretions merely, — a great part of it probably being an exudation of blood from the mucous surface. I believe, also, that these matters vary very remarkably in the ardent climate fever, in the more malignant forms

of marsh or endemic fevers, and in the pestilential yellow fever — the diseases thus characterised. Dr. JACKSON remarks that the secretions from the digestive mucous surface are ropy and clear during the early periods, and are brown or black in the latter — sometimes black as soot; and that the sooty or ink-like colour is chiefly observed where the head and stomach are simultaneously attacked. When we consider that the blood becomes darker than natural, as well as otherwise changed, early in the period of exhaustion, and that the liver and mucous follicles of the digestive canal, with the kidneys, are the principal organs of depuration, or channels by which the elements producing these changes are eliminated from the circulation, we need not be surprised at the secretions, which these elements go to form, and which these organs excrete, presenting somewhat similar characters. It must however be admitted, that the share which the secretions perform in producing this phenomenon, or that which the exudation of blood has in giving rise to it, will vary much in different varieties or cases of intertropical fevers. — The rapidity with which a dissolution of the tissues takes place after death, in the severe forms of climate fever, deserves notice, as marking the rapidity of vital exhaustion, and as resulting from the changes of the blood; these changes commencing with the stage of exhaustion, and advancing until this fluid is no longer capable of influencing the nervous system, and of preserving the irritability of contractile parts — or until it poisons, instead of exciting, the sensitive and moving tissues.

376. *iii. TREATMENT.* — The means that should be employed in the *mild* and *severe* forms of inflammatory fever are the same — the only difference being in the promptitude and energy with which they ought to be administered. In the mild diseases, particularly in cold or temperate climates, the febrile excitement is much more prolonged than in the severe, which rapidly exhausts itself by its violence. The necessity, therefore, of restraining it at its commencement is great in proportion to its activity. In the milder forms, vascular excitement may continue several days, and depletions may be practised with advantage as long as this state persists; but, in the severe, the period in which they can be employed with benefit passes away sometimes in a few hours; and continues seldom beyond the third, and rarely beyond the fourth day. As in the state of excitement, so in that of exhaustion, the treatment is the same in all the varieties of this fever — the only difference being in the choice of means, in the activity with which they should be employed, and in the appropriation of them to the varying circumstances of the case.

377. *A. — a. During excitement*, and especially at its commencement, vascular *depletions* should be practised, and carried as far as the state of the pulse and other circumstances will permit; and in the manner described in the article BLOOD (§ 64.). The observations already made on this subject (§ 128—138.) will guide the inexperienced practitioner; but it should not be overlooked, that, in the intense climate fever, vascular depletion should be prompt, from a large orifice, large, and repeated, to be successful; and that the quantity of blood abstracted should depend chiefly upon the effect produced. Dr. JACKSON justly remarks that it should be taken in quantity

sufficient — whatever may be the amount — to relax the surface, and set free the secretions. Less than three pounds is rarely sufficient to produce this effect; and six have not been more than sufficient on some occasions: but whatever the amount may be, it will do comparatively little good if we stop short of the quantity which is requisite to effect a decided change. If delayed until the excitement is about to terminate in exhaustion, no benefit — or even mischief — may result from it; for the tonic of the vascular system will have then become too far weakened to admit of the vessels accommodating themselves to a considerable loss of blood. When, therefore, the symptoms indicating the passage of excitement into collapse, or the deceptive abatement of the febrile action indicating this state, is observed — and particularly if yellowish blotches appear about the mouth, face, or breast — the time for bleeding with advantage has passed. If, however, headach is still urgent, the pulse still strong, and the features have not collapsed, blood may yet be abstracted cautiously and in moderation. When the cerebral affection is considerable or persisting, and is unattended by marked symptoms of exhaustion, depletion, general or local, may be repeated. Where the headach is particularly intense — rendering, throbbing, &c. — with hot inflamed eyes, one bloodletting, however large or early, will seldom be sufficient. In such cases, the body should be immersed in a tepid, or slightly warm, bath, and well scrubbed with brushes, &c., until the cutaneous circulation is rendered free. Cold should also be applied to the head, both during the bath and subsequently, the hair having been cut off. After the patient is removed to bed, the vascular action and headach will often become again excessive; and, although a very few hours only may have elapsed, will require the repetition of very large depletions. Spontaneous hæmorrhage during excitement should not be arrested. In the most severe cases, especially when determination to the brain is great, epistaxis often occurs, but is generally slight, or almost instantly disappears. In these, vascular depletions, aided by the other means appropriate to this state, ought to be most energetically practised; for nothing else will save from fatal changes taking place within the brain, or from as fatal exhaustion, and its effects.

378. *Purgatives*, in one form or other, are a material part of the subsequent means. *Calomel* with *jalap* and *James's powder* may be given, in the form of pill, from time to time; and, after a few doses have been taken, a cathartic enema should be administered, and repeated. As to the choice of the enema, the practitioner should be guided by the progress the disease has made. At an early period, *sea water*, with or without the addition of castor oil, or of extract of colocynth, is appropriate: subsequently, olive oil and oil of turpentine may be substituted for the latter. — *Emetics* are not suited to any state of this fever; although they are often serviceable in fevers which have been confounded with it, more especially at the commencement of the various forms of marsh fever.

379. *b. Refrigerants*, when judiciously exhibited, are valuable adjuncts in the period of excitement. Those already enumerated, both *internal* and *external* (§ 139—141.), should be perseveringly em-

tion between the globules of the blood, and consequently of a defective power of coagulating, and of altered colour, has been shown by TOWNX, and by every writer since his time, and is generally admitted: but the observations of Dr. STEVENS, as to the progressive loss of saline ingredients, which the blood undergoes with the progress of exhaustion, although now published several years, have not received that confirmation, for which there have been sufficient time and opportunity. They are not, however, therefore, altogether to be thrown aside, more especially as my experience has furnished me with facts calculated to support them in some measure. The exhaustion in this disease arises, — 1st, from the previous excitement; and, 2dly, from the changes induced in the blood in the course of this stage, especially at its acme, manifestly depressing the organic nervous influence, the tonicity of the vascular system, and the action of the heart itself, to an extent often incompatible with the continuance of life. It is in this manner that death generally takes place in the intense climate fever; for, however considerable the lesion which the early excitement may have occasioned in the brain, or digestive organs, death is seldom the result of it in either of those parts. It should, moreover, be recollected that the disease cannot be cured by bloodletting alone, however necessary it may be to the subduing of excitement in the early stage; for although this state may be lowered by it, still dangerous exhaustion may nevertheless supervene with the characteristic changes of the blood, and all the consequent phenomena described by the earlier writers on this fever, particularly by TOWNE, WARREN, HUME, LINING, HILLARY, &c.

382. *a.* From these considerations it is manifest that the *intentions of cure*, in this stage of the disease, should be — 1st, to support or rally the manifestations of life in the different organs — to oppose the progressive vital exhaustion; 2dly, to counteract those changes which take place in the blood and vascular system. These indications should be simultaneously carried into effect; for the alterations in the state of vascular action and tone, as well as in the constitution of the blood, are more or less dependent upon the change in the organic nervous influence. — At the commencement of this period, and when vascular action still continues high in the encephalon or digestive mucous surface, a moderate local depletion may precede measures calculated to fulfil these intentions: but even this form of depletion can seldom be carried far; for the tonicity of the vascular system generally, and especially of the capillaries supplying the mucous surfaces, is too far exhausted to admit of that accommodation of the vessels to a considerable diminution of their contents which is so requisite to the restoration of a healthy state of circulation. The characteristic phenomena of the last stage — the hæmorrhages and discoloured blotches — are manifestly owing as much to the exhaustion of organic nervous influence and of irritability, as to the attendant changes in the blood. It is to these latter changes almost solely that Dr. STEVENS directs his means of cure in this stage; but it is evident that the vital conditions on which they depend should receive equal attention. He states that the quantity of the muriate of soda is greatly diminished in the

last stage of this and other malignant diseases; and that, in order to supply the deficiency, he at first gave a strong solution of this salt with nitrate of potash. He subsequently found that the chlorate of potash and other active saline agents answer the purpose equally well, especially those which do not irritate the stomach; and he now seems to prefer a combination of the muriate and carbonate of soda and chlorate of potash. The basis of this pathology and treatment is the relation subsisting between the colour of the blood and the saline matters contained in it. The power of certain salts, particularly the muriate of soda, the nitrate of potash, the tartrate of potash, &c., as well as of the alkaline carbonates, to render the venous blood florid, and to affect its fluidity and coagulating powers, was long since fully demonstrated by VERHEYEN (vol. ii. p. 29.), SCHWENKE (*Hæmatologia*, p. 190. *et passim*), HALES (*Hæmatostat.* p. 154.), ELLER (*Mém. de l'Acad. des Sc. de Berlin*, t. vii. p. 13.), BOERHAAVE (*Elementa Chymie*, t. ii. p. 378.), PETIT (*Lettre Seconde*, p. 34.), HALLER (*Elementa Physiol.* t. ii. p. 74.), SAUVAGES (*Sur l'Effet des Médicaments*, p. 37.), and others. A combination of the nitrate of potash and of the muriate of ammonia was always employed by HILLARY in this disease, and is applicable to every period of it. Sea water has long been a popular remedy for it and other West Indian fevers, and is very strongly recommended by AREJULA and Mr. N. DICKENSON as an emema. Dr. CHISHOLM employed, in 1798, the chlorate of potash, and remarked its effects upon the blood; but, as Dr. STEVENS justly states, he exhibited other substances calculated to counteract its influence on the disease. But granting that the colour of the blood is changed to its healthy state by these salts, it does not follow either that they shall be absorbed into the circulation during the advanced stage of this fever, or that they shall have the effect of rallying the exhausted powers of life. As to both these circumstances, the sanguine expectations of Dr. STEVENS require confirmation. There can be no doubt that, to be serviceable, these medicines should be given sufficiently early in the exhaustion to allow time for their absorption; and that substances which irritate the digestive mucous surface, and prevent or delay absorption, should not also be exhibited. In the present state of our knowledge, and judging from some experience of the effects of these salts in the advanced stages of other severe fevers, I infer, that they ought not to be confided in alone, but should be conjoined with such other means as are calculated to rally or support the vital manifestations, and promote the excreting functions — always recollecting that, in order to preserve the blood in a state suitable to the continuance of life, the depurative actions of the various excretories require to be promoted.

383. *b.* In the early stage of exhaustion, HILLARY's saline mixture may be prescribed; or the same salts — the nitrate of potash and muriate of ammonia — may be given in camphor julap; the quantity of camphor being regulated according to the grade of depression. The chlorate of potash may likewise be given in the same vehicle; or the citrate or tartrate of potash or soda, with an excess of the alkali. It is very important, to avoid such means as will increase the irritability of stomach characterising this stage of the disease,

seasoning fever. It is observed chiefly in adults of the bilious or bilio-sanguine temperaments, and in persons addicted to spirituous liquors. It is a very prevalent fever in the countries bordering on the Mediterranean, in the East Indies, and in America, and consequently in fleets and armies in these parts.

389. *Gastro-bilious fever* is caused chiefly by exhalations from the soil, or from vegetable and animal matter undergoing decomposition, in connection with atmospheric heat; by exposure to the sun; by the night airs or dews, and the influence of cold following such exposures or excessive exertion or high ranges of temperature; by intemperance and errors of diet or of regimen; by excesses in vinous or spirituous liquors; by great exertions following inactivity; by over-eating, or by a sudden transition from a very poor to a very full or rich diet, as in the case of soldiers and recruits; by anger and other mental emotions; and by the causes already enumerated (§ 330. b.)—It most frequently, however, arises from the concurrence of two or more of these causes. The influence of infection in producing it has been doubted; but the experience of Drs. DENMARK and BOYD, in ships and hospitals in the Mediterranean, has demonstrated its occasional origin in the cause—or at least the power infection evinces in producing a severe modification of it.

390. i. *DESCRIPTION*.—This fever, in robust and plethoric persons, approaches severe inflammatory fever on the one hand, and the more inflammatory forms of remittent on the other: or it presents a predominance of the characters of either, according to the intensity of the causes and the peculiar circumstances of the affected. The chief difference between inflammatory fever and it, depends upon the causes whence they respectively proceed; the former arising principally from atmospheric vicissitudes and climatorial influence, in connection with suppressed perspiration; the latter chiefly from marsh and vegeto-animal miasms (see *Diagnosis*). Its similarity to, and connection with, remittents, are referrible to the origin of both in the same causes; the only differences between them resulting from the intensity and concurrence of the causes, and from individual predisposition—being differences chiefly of grade and of type, as shown by Dr. BOYD, and confirmed by my own observation. That it should therefore be confounded with these fevers, cannot be a matter of surprise, and is of little importance as respects the treatment. But when it is mistaken for the synochoid and adynamic species with predominant affection of the digestive mucous surface, then the results may be serious.

391. *Gastro-bilious fever* is generally preceded by lassitude, nausea or want of appetite; by dull pains in the back and limbs; and by flatulence and indigestion. The breath is foetid; the tongue is covered by a yellowish mucous coating; the mouth is clammy, and the taste perverted; the bowels are costive, or relaxed, or irregular; and the countenance is pale or somewhat sunk. This state—the *premonitory stage*—may continue several days, the patient not being confined to bed; but generally in the morning he is seized with chills or rigors, preceded by a sensation of cold creeping along the spine. To these soon succeed severe frontal headach, vertigo, nausea, vomiting, burning heat of skin, restlessness, watchful-

ness, slight anxiety at the præcordia, pain and oppression in the epigastrium, and in one or both hypochondria, with more or less soreness, fulness, and tenderness. The eyes are moist and injected, the conjunctiva often yellowish; the face is flushed; the breathing oppressed and accelerated, the pulse full, large, quick, and strong, rarely hard; the tongue is clammy, moist, furred, and yellowish, with a bitter taste in the mouth; the thirst is urgent, the breath foetid; the bowels are obstinately costive, or loose; the stools bilious, and the urine scanty and dark. When the stomach and bowels are inordinately affected, cerebral congestion very frequently supervenes at a later period. As the disease advances, the pulse feels less full, and is weaker than in health. The thirst and anxiety are increased; and the upper parts of the body are sometimes covered by a profuse sweat, whilst the skin still continues hot.

392. If the attack be very severe, or neglected at the commencement of reaction, the pain of the head is aggravated; and a disinclination to answer questions, stupor, and insensibility appear about the second or third day. The eyes are turgid or inflamed; a bilious yellow tinge spreads from the face downwards over the body; the tongue is covered by a thick yellow crust, is red at its sides, and dry and brown in the centre; the strength is diminished; nausea with bilious vomiting is often distressing; the pulse becomes weaker and quicker; and the patient has an insatiable thirst, and desire of cold acidulated fluids. The urine is very high coloured, voided often, and produces scalding in passing it. The bowels are either costive or loose.

393. If the disease has not been mitigated, a slight remission occurs on the third, fourth, or fifth day, generally in the morning; the face and chest being covered by perspiration, and the temperature of the surface reduced. But the symptoms are exasperated towards evening; the tongue becoming drier and darker; the epigastrium and hypochondria more painful, tender, and often also tumid and tense; the pulse more rapid, constricted, or weak. The anxiety at the præcordia is now changed into severe pain, aggravated on pressure, with oppression and frequent sighing; the countenance is sunk; there is vomiting of putrid or offensive bile; the stools are liquid, greenish brown, foetid, slimy, and occasionally bloody or dysenteric; the skin is often deeply jaundiced, and emits a putrid bilious odour. The patient is now collected, but various adynamic and malignant symptoms appear from the fifth to the seventh or eighth day. These are—tremors of the extremities, and of the tongue when held out; startings of the tendons; pain about the pubes, with inability to pass the urine; vomiting of a dark, glairy matter; difficulty of swallowing, sometimes swelling and suppuration of the parotid glands; tympanitic distension of the abdomen; inexpressive, glassy eyes, dilated pupils; clammy sweats, difficult and anxious breathing, and black tongue. To these succeed delirium, coma, intermitting pulse, cold extremities, and death, sometimes with convulsions. Petechiæ, blotches, and passive discharges of blood from the nostrils, gums, fauces, &c., are but rarely observed.

394. *Modifications*.—All the above symptoms are not present in the same case, nor always run the same course. In the young, strong, plethoric

spects there is little difference between it and the severer forms (§ 230. 232.) of that disease, excepting that its severity is often greater, and its duration shorter. Indeed, this is but a variety of marsh fever, owing its continued and otherwise modified characters to high temperature and other concurrent circumstances.

398. As this fever varies from the ardent seasoning, to the distinctly remittent type, with the intensity and concurrence of the causes producing it; and as it may occur contemporaneously with the pure climate fever, and with the more inflammatory forms of remittent fever, as frequently observed in the West Indies and Mediterranean during the hot months, particularly among soldiers and sailors; so it is often difficult to distinguish between them. The chief circumstances, however, which will fix the attention of the practitioner, are—the manner of invasion; the distinctness, obscurity, or absence of remissions; the degree of excitement characterising the early period, especially as expressed upon the vascular system; the kind of excitement, particularly in respect of sthenic or asthenic action; and the state of the circulating fluid, and of the secretions and excretions.

399. *c.* From *epidemic or pestilential yellow fever*, this disease is distinguished—by passing into the periodic type in many instances, and by frequently leaving visceral disease behind it; by its attacking the same individual oftener than once, if he have intermediately undergone a change of locality or climate; by the more inflammatory or sthenic character of the period of excitement, and the much less remarkable change in the blood and soft solids from the commencement; by the headach being confined chiefly to the temples; by the yellowness appearing early, and first in the eyes, and being of bilious origin; by much less irritability of the stomach in the advanced stages; and by its longer duration—generally from five to fourteen days. In pestilential yellow fever, the yellowness of the skin is not frequent, and is of a pale lemon colour; the face has a putrid, bloated, or livid hue; its duration is from one to five days; it never passes into the periodic type, nor leaves visceral disease behind it; fatal cases always being attended by the black vomit at their close. Moreover, remittent, inflammatory, and bilious fevers are never infectious, unless under peculiarly favourable circumstances, when the latter may assume this character; but epidemic yellow fever is remarkably infectious; and, whilst these are generally benefited by vascular depletions during the period of excitement, the epidemic malady requires a different method of cure.

400. *iv.* The *Prognosis* depends upon the intensity and concurrence of the exciting causes; upon the severity of the attack; upon the treatment adopted at the commencement; upon the state of vascular reaction; and upon the complications that may arise.—*a.* It may be favourable, if the attack be mild or simple, the skin moist, the vomiting moderate, and the matters ejected consist chiefly of mucus or ingesta; if the tongue become moist, the bowels loose, and the stools bilious; if the nervous and vital powers be not much reduced; and if the yellow suffusion be slight or slow in its progress.—*b.* An *unfavourable* opinion should be formed, if any of the

more dangerous symptoms enumerated above supervene (§ 393.); especially if the skin be either early or deeply yellow, or the sensorial functions early disturbed; if the period of exhaustion be attended by deep redness of the face, dulness of the eyes, much anxiety, or laborious respiration, by a feeble, creeping, or intermitting pulse; by very scanty and dark urine; great pain, tension, or fulness in the epigastrium and hypochondria; difficulty of swallowing; tremors of the tongue or of the extremities; by startings of the tendons; involuntary discharges of fæces, particularly if they be of a black colour; incessant vomiting, especially if the egesta be dark, or great in proportion to the ingesta; by petechiæ, enlargements of the parotids, and coldness of the extremities.

401. *v.* TREATMENT.—The indications are—1st. To evacuate morbid secretions in the *prima via*, and restore the suppressed perspiration, in the stages of premonition and invasion;—2d. To moderate the vascular reaction attendant upon the period of excitement;—3d. To obviate determination to a vital organ, and mitigate urgent symptoms;—and, 4th. To support the vital powers in the consequent exhaustion.—The first indication is best fulfilled before reaction is developed. At this time an *emetic*, followed by diluents, by the *vapour bath*, or by warm fomentations, *sudorific drinks*, and by warm emollient enemata, will generally restore the suppressed perspiration, and moderate the consequent reaction.—*Bloodletting* is the next important means; but the utmost care should be taken not to resort to it before reaction has commenced, or when exhaustion is about to supervene. Dr. DENMARK has insisted upon this, and my experience fully confirms the propriety of the advice. I have seen this fever most remarkably exasperated, and almost fatal syncope occasioned, by the abstraction of even two or three ounces of blood during the stage of invasion, before vascular excitement was developed. When this pathological state has supervened, depletions should be energetically and early practised, but with due regard to the state of the pulse, and to the complications and other circumstances of the case; and they ought to be aided by cold application to the head, and purgatives. A full dose (from 10 to 20 grains) of calomel may be given immediately upon the first bloodletting, and afterwards the tartrate or citrate of soda or of potash may be taken, at short intervals, in the state of effervescence, with an excess of the alkali.—As long as vascular excitement is energetic, antiphlogistic remedies should be employed, as recommended above; and, in addition to those now mentioned, there are none more deserving of adoption, than small and frequent doses of the nitrate of potash and muriate of ammonia. Cold affusions, and cold spongings of the surface, are also useful auxiliaries. When internal viscera are oppressed, and reaction is not free and open, the tepid bath, or tepid affusions, will be serviceable.

402. The *second* indication is to be fulfilled by local depletions, in the first instance, followed by rubefacients, blisters, and the other means detailed when treating of the remittent form of bilious fevers (see § 251, 252—258.).—The exhaustion in the latter period requires the same

just referred, and in others adjoining them, to which medical men may proceed to serve, it will be found that the unacclimated, according to their constitutions, will be affected by inflammatory fevers of various grades of severity, in healthy localities and in hot and dry seasons—with bilio-gastric and remittent fevers, of various forms, in miasmatic situations and sickly seasons,—whilst the acclimated shall escape the first of these maladies, in the former of these circumstances, and the second in the latter; or, if attacked, they shall experience only remittents or intermittents. The pestilential yellow fever makes no such distinctions. As already stated, and as will be hereafter shown, its spread is limited only by a low range of temperate, by a previous attack, and by circumstances that circumscribe its infection. Whilst the former fevers are met with in all warm climates, and occur either sporadically or endemically in them, and are not infectious, this last appears only on the intertropical shores of the Atlantic, or parts adjacent, during hot seasons, rages for a time, and then disappears. Thus, it occurs after long intervals, prevails sometimes for years, and then takes its departure, as will be shown in another place. When we consider the very different constitutions—original and acquired—of those who inhabit European colonies within the tropics,—when we review the appearances of the new-comer, of the old resident, of the creole, of the mulatto of various grades, and of the negro, and take into account the modes of living, the exposures, and the various other circumstances connected with each class, and further connect all these with variety of situation, season, and temperature,—we cannot be surprised at the very different forms which fever assumes among them.

XIX. MUCOUS OR PITUOUS FEVER.—SYN.

Febris Mucosa, F. Mesenterica, Baglivi; *Morbus Mucosus*, Roederer and Wagler; *Febris Pituitosa*, Stoll; *Febbre glutinosa gastrica*, Sarcone; *Fièvre Adéno-méningée*, Pinel; *Fièvre Muqueuse*, Fr.; *Schleimfieber*, Germ.

406. CHARACT.—Slight febrile reaction following chills, with mucous evacuations, and pains in the back and limbs, and often with slight remissions.

407. i. Causes.—This variety approaches bilio-gastric fever on the one hand, and the enteric form of synochoid fever, on the other. It may occur either sporadically, endemically, or epidemically; and, in either case, it may arise from, or pass into, fever of a periodic type. It may even run into dysentery; and, from the severity of the pains in the limbs attending it, may closely resemble an attack of rheumatism. Its characters, both constant and contingent, result from the various circumstances, both intrinsic and extrinsic to the patient, concurring to cause it. These are chiefly—*a.* The epochs of childhood and old age; the female sex; the lymphatic, leucophlegmatic, and nervous temperaments; prolonged watchings; excessive fatigue or indolence; languid, weak, delicate, and pale states of frame; chlorosis, intestinal worms, or a cachectic habit of body; the debility caused by previous disease, as by agues, mesenteric obstructions, or by excessive venereal indulgences.—*b.* Living in low, humid, cold, and marshy places; privation of light and of the sun's rays; the autumnal season, or prolonged wet and cold weather; want of cleanliness; the use of indigestible vegetables, of unripe fruit, of tainted animal food, or of unwholesome fish, particularly shellfish; of stagnant, marshy, or impure water; the privation of accustomed stimuli; the abuse of emetics or of purgatives; insufficient nourishment, &c. The most common of these are cold and humidity, unhealthy localities, and unwholesome ingesta. This fever is endemic in the situations just specified; and it has occasionally appeared epidemically during autumn and winter, particularly after much wet

408. ii. Symptoms.—Some of the older writers

confounded mucous fever with *influenza*, with *catarrhal fevers*, and even with *bronchitis*. But more recent observers have, with greater propriety, confined their description of it to that form of general affection, which is characterised by slight febrile excitement and nervous depression, with predominant disorder of the digestive mucous surface, of a sub-acute form, accompanied with mucous or slimy evacuations—admitting, however, the occasional complication of bronchial irritation with it.

409. This fever is preceded by general uneasiness, by a sense of heaviness; or pains in the limbs, loss of appetite, disturbed sleep, acid or acrid eructations, and cold or chilliness, which is first felt in the lower extremities. To these succeed, marked dislike of food, slight thirst, nausea, sometimes with vomiting of a whitish, transparent, and viscid fluid of a nidorous or acid taste; a sense of weight at the epigastrium, with fulness; flatulency and colicky pains, with slight tenderness in the abdomen, and relaxed bowels. The tongue is usually moist, white, and covered by a mucous coating, with a sickly or unpleasant taste of the mouth; aphthous exudations are occasionally observed on the fauces and lips; the saliva is sometimes abundant; and the breath is foetid and heavy. The evacuations are mucous, more frequent than natural, sometimes tinged with blood, voided with slight tenesmus, and, in children, often with *prolapsus ani*. In rarer instances, costiveness, or an irregular state of bowels is observed;—mucous diarrhoea and costiveness alternating; and, occasionally, worms are voided. The urine is either scanty or natural at first, of a citrine tint, and sometimes passed with pain; it deposits a mucous sediment of a greyish or brick-colour at an advanced stage. The temperature of the surface is not much increased, unless during the evening exacerbations; and, towards the acme and decline, a gentle perspiration breaks out, especially in the morning and during sleep. A slight eruption often occurs during the night, but generally disappears in the morning. The pulse is feeble and small, but seldom much accelerated, unless in the evening and night. The patient complains of a sense of weight or of pain in the scapula and occiput; with vertigo upon sitting up; of confusion of ideas, and somnolency, without the ability to sleep; of depression, sadness, and restlessness; of pains and soreness in the hypochondria, in all the limbs, and in the joints; and occasionally of cough, noise in the ears, and deafness.

410. iii. The Diagnosis rests upon the circumstances connected with the origin of the disease; on the appearance of the evacuations; on the colicky pains in the bowels; on the softness, the very slight acceleration or slowness, of the pulse; on the little increase of the temperature, and the humidity of the skin; on the slight degree of thirst; and on the very moderate or sub-acute character of all the febrile phenomena. In its slighter forms, the complaint is commonly described as fever from cold, or as a cold in the bowels and limbs. In some cases, it presents either a dysenteric or a rheumatic character; and is with difficulty distinguished from dysentery, or from rheumatism in other instances, unless the history of the disease, and the state of the bowels and of the evacuations, be closely observed. It

laxative enemata. — *f. Sixthly*, to alleviate urgent symptoms, or determinations to particular organs — as to the head, the lungs, or liver — by local depletions, external derivatives, rubefacients, &c. — *g. And, seventhly*, to support the powers of life in the latter period by gentle tonics, light nourishment, and by cinchona or the sulphate of quinine, especially when the disease presents remissions, or is disposed to pass into the periodic type, or into rheumatism, and particularly in humid, marshy, and unwholesome situations. I have found the following aperient very serviceable in this form of fever, when the bowels required to be gently but freely evacuated. Others, however, in the APPENDIX (F. 266. 430. 827.), will equally useful.

No. 222. R. Potassæ Supertart. in pulv. 3j.; Potassæ Nitratis 3ij.; Confect. Sennæ 3ij.; Syrup. Aurantii 3j. M. Fiat Electuarium, cujus capiat Coch. i. vel ij. minima.

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XX. FEVER, SWEATING.—SYN. *Miliaris Sudatoria*, *Sudor Miliaris*, *Miliaria* (from *miliun*, a millet seed), *Sudor*, *Sudor Anglicus*, *Sudor Picardius*, *Febris Sudatoria*, *F. Helodes Sudatoria*, *Sudatio Febris Helodes*, *F. Miliaris*, *F. Vesicularis*, *Purpura alba*, Auct. var.; *Miliaris*, Sauvages and Sagar; *Febris Purpurata*, *F. Hoffmann*; *La Suette*, *La Suette Miliare*, *La Suette Epidémique*, *Fièvre Miliare*, *Pujol*, *Gastellier*, *Menière*, &c.; *Der Friesel*, Germ.; *Miliary Fever*, *Sweating Miliaria*, *Sweating Sickness*.

416. DEFIN.—After lassitude and general uneasiness, a sudden attack of febrile disorder, with most profuse and continued sweat, frequently followed by an eruption of miliary vesicles, the disease occurring epidemically and being infectious.

417. I have preferred the name *sweating fever* to that of *miliary fever*, as sweating is the constant and characteristic phenomenon of the disease, and is present in the mild, as well as in the most malignant cases; whereas the miliary eruption is sometimes wanting in both. This malady should not be confounded with the febrile affections of lying-in women, attended by sudamina, that have improperly been denominated miliary fever, from the character of the eruption sometimes occurring as a symptom of them, during hot seasons and a too heating regimen. This is a specific fever, seldom observed in modern times, in this country, although frequently prevailing epidemically in many parts of Continental Europe.

418. i. *History*.—The epidemics which have been variously denominated, as stated in the *Synonymes*, have manifestly been modifications of the same disease, caused by the varying circumstances connected with its appearance. — The epidemic sweating sickness, which appeared between 1485 and 1528, and which ravaged England in these and several intermediate years, was evidently, as supposed by MM. OZANAM and RAYER, a most violent form of this malady, in which the sweat was the most prominent symptom, and the progress most rapid and acute. But many cases noticed by BOYER and others, in recent epidemics, were similarly characterised. — (a) The epidemics observed in France by RIVIERUS, during 1618; in Germany by WELSCH and LANGIUS, in 1652; in Francfort in 1653; in Augsburg in 1660; in Bavaria in 1666; in Holland by GRISWALD, in 1666; in Hamburg in 1675; in London and in Edinburgh, towards the end of the seventeenth century, by HAMILTON and SIBBALD; in Saxony in 1694; in Hungary in 1697; in Plymouth by HUXHAM, in 1738; in Normandy by LE PLEU-DE-LA-CLOTURE, in 1740; near Mantes by QUESNEY, in 1750; in Navarre by AVOUSTINIS, in 1755; in Bayeux from 1769 to 1776; in Piedmont by ALLIONI, in 1758, and by DAMILONIO in 1782; and in Toulouse and the vicinity by GALLET DU PLESSIS, in 1781; were essentially the same disease. In all these, the fever was ushered in by chills, horripilations, and other premonitory and invading symptoms, which were soon followed by pains in the head, loins, and limbs; by nausea, flushing, profuse sweat, dyspnoea, and, about the third day, by a miliary eruption. Numerous other epidemics that have presented this form of eruption as a prominent symptom, have been described by writers, who observed them during the two last centuries. But in these it was apparently caused, either by a too heating treatment and regimen, or by the neglect of evacuations during the early stage of the disease; and it was not always connected with excessive sweat. It was, indeed, in most cases merely a symptomatic eruption appearing at an advanced period, in a similar manner to petechiæ, &c., with which it was even sometimes associated. In the epidemics, however, which I have above enumerated, the eruption was not a consequence of neglected evacuations, nor of a heating regimen, for the treatment was generally depletory and cooling, and it occurred earlier in the disease, although always preceded by profuse sweat, which was coëtantaneous with the vascular excitement, and always peculiar and offensive. So thick a vapour generally surrounded the sick, arising from the excessive perspiration, that the flame of a candle was obscured by it.

419. (b) The epidemic occurrence of sweating fever in various parts of Picardy was first noticed in 1718. Since that time it has frequently appeared in that province, and in other parts of France; and has more nearly approached, than the epidemics noticed above, the characters of the sweating sickness of the 15th and 16th centuries, in respect of the rapidity of its course, the profuse sweat, and the frequent absence of the miliary eruption. The sweating fever of Picardy appears to have prevailed more or less in various parts of this province and of Flanders, from 1718 till 1747. In this year it appeared in Paris; and

ation, the crepitating rattle, or a blowing noise in some of the lobes of the lungs, diminished sonorousness of the chest, a full and frequent pulse, and bloody expectoration or hæmoptysis, indicating inflammation or inflammatory congestion of the respiratory organs. When the *digestive organs* are predominantly diseased, the patient complains of an acute constrictive pain in the epigastrium, with urgent anxiety, frequent sighing, a sense of suffocation, or of weight in the chest, and an unusual pulsation in the region of the stomach. These appear from the commencement, are exacerbated at intervals, and are most severe just before the eruption. In others, the symptoms indicate affection of the bowels, with constipation; and in some, severe pains are felt in the hypogastrium, with scanty, high coloured urine, and difficulty in voiding it.—This violent form of the disease may prove fatal in twenty-four or forty-eight hours, or in three or four days; but it commonly runs its course in from one to two weeks in favourable cases; sometimes, however, extending beyond three weeks. During convalescence, debility is its chief consequence, secondary affections being rare. Those that do occur, are gastro-intestinal disorders, and the eruption of boils.

422. The *alterations of structure* have been imperfectly observed.—When a fatal result has been preceded by anxiety, pain, or burning in the epigastrium, the mucous coat of the stomach and duodenum has been found much injected. In the cerebral complication, the brain has been found congested, the membranes injected, and the ventricles filled with serum. In the pulmonary complication, congestion of the lungs, and hepatization of portions of it, have been remarked. Although epidemic visitations of this disease in France have been frequent in modern times, and fatal cases very numerous, yet its pathological anatomy has been very imperfectly investigated. It is evident that death is caused chiefly by the severity of the complications accompanying it.

423. iii. *Diagnosis*.—The constant, the profuse, and the peculiar sweat attending the disease from the time of its development, not only characterises it, but distinguishes it from all other fevers. The severity of the complications in the intense form, especially at the time of attack, and upon the appearance of the eruption, the character of the eruption, the epidemic prevalence of the malady, and its infectious nature, further serve to distinguish it. The descriptions of the *sweating sickness* by CAIUS, WILLIS and others prove that it was a more intense form of this disease than has been lately observed. The characteristic symptoms of the former all exist in the latter; and, although the eruption is not mentioned in the sweating sickness, this appears not to have been a general symptom in recent epidemics. M. RAYER states it to have been wanting in a great number of cases, in the epidemic of 1821; and M. MENIÈRE makes a similar remark as to that of 1832.

424. iv. *Prognosis*.—Sweating fever, as observed in modern times, is a mild disease in its simple form. Predominant affection of any internal organ will render the prognosis unfavourable, according to the severity of such affection. However alarming the symptoms, if they decline

upon the appearance of the eruption, a favourable issue may be anticipated. M. RAYER states that, in 1821, the eruption was independent of irritation of the stomach; that it was confluent without violent previous pain in the epigastrium or nausea; that it did not always succeed the most profuse and incessant sweat; and that it did not invariably appear in cases where the gastro-intestinal disorder was the most remarkable. Death was often sudden—more unexpected than in the common eruptive fevers,—and often followed upon shrivelling of the vesicles. The greatest number of deaths occurred in 1821, between the ages of 23 and 33. The mortality in males was one in thirteen; and among females, one in twenty-eight. In the earlier epidemics observed in Picardy, the mortality was very much greater than this. It was greatest at the beginning and decline of the epidemic; and among bakers, smiths, and farriers: but was variable in different townships. The epidemic of 1832 was in many instances followed by pestilential cholera. The latter malady often followed the decline of, or convalescence from, the former, and even occasionally appeared in its course; the mortality being thereby much increased.

425. v. *Causes*.—The theatre of the epidemic of 1821, was bounded by extensive forests. M. RAYER states, that the disease is endemic in some situations; and that it may occur sporadically where it has prevailed epidemically. It has been observed only between 43° and 60° North latitude. Moist and shady places, excessive heat, and an atmosphere surcharged with electricity, seem to favour its irruption. No age gives immunity from an attack; but adults and females are most obnoxious to it. M. MENIÈRE states, that many of those who had the disease in 1821, were again attacked, and died of it, in the epidemic of 1832. When once engendered, it spreads by infection, in the same manner as typhus, scarlatina, and measles. Unhealthy situations, and the poor in the vicinity of the place where it first appeared, suffered in proportion to their proximity, during these two epidemics. M. MENIÈRE remarks that, of the numerous epidemics which have occurred in France, and in other countries, since 1718, to the present time, there is none which shows its origin, either in marsh exhalations, or in unwholesome food.

426. vi. *TREATMENT*.—Isolation, temporary migration, and avoidance of the affected, are the only preservative means that can be depended upon in this malady.—The *mild states* require but little aid; and it is doubtful if medical treatment will either shorten or alleviate the attack. In the *severer forms*, and where some internal organ is especially affected, appropriate remedies ought to be employed to guard it from danger. If the affection of the head, or of the chest, or of the digestive organs, be slight, *local depletions* will give relief. If the local complication be severe, general *bloodlettings*, with powerful external and internal derivatives, as blisters, sinapisms, purgatives, &c., will be occasionally used with success. But M. RAYER remarks, that the cerebral affection, when severe, is often rapidly fatal, notwithstanding the repeated abstraction of blood, and that the nervous phenomena are occasionally independent of actual inflammation.—After the eruption, bloodletting is always injurious; and if

species of continued fever.—As, therefore, the causes of *synchoid*, and of these forms of *typhoid* fever, are often the same—their intensity and concurrence producing the more severe states of disease, as well as giving rise to an infectious miasm—the view which is about to be taken of them with reference to the former species, will very nearly serve also for the latter.

431. i. CAUSES.—A. Of the remote causes of the varieties of continued fevers most frequently observed in this and other temperate climates, those which precede the operation of the more effective causes, which are usually internal as respects the œconomy, and which, from the circumstance of their disposing the system to the operation of these latter causes, have been usually called the *predisposing*, require first to be noticed. It is often difficult to determine in what the disposition to be affected by these forms of fever consists, and in what manner it is caused. To say, with many, that it arises from an increased susceptibility, does not advance our information one step, and is merely the substitution of one term for another. Close observation of the circumstances connected with the origin of these diseases will show us, that the disposition to become affected with them is not the result of exactly the same circumstances as favour the appearance of ardent fever. A depressed or weak state of vital power, especially as manifested in the nervous systems, but particularly in that of organic life, seems to be one of the most common causes of predisposition. This is proved by the fact, that perfect health, mental activity and energy, confidence in various means of prevention, the moderate use of tonics, &c., enable the body to resist the impression of the exciting causes, particularly infectious and mephitic effluvia; and that fear of the disease, despondency, the depressing feelings and emotions, fatigue, increased sensibility, disorder of the digestive and assimilating functions, &c., are amongst the most common occasions of these causes taking effect.—But, although diminished energy of the powers of life has a marked influence in favouring the operation of the exciting causes, yet something more is required; and this must be referred to a certain constitution of frame, which is influenced sometimes in a relative manner only by relative causes, and at other times only by positive causes, and which often either resists the operation of the usual causes altogether, or yields merely to the combined action of a greater or less number.

432. A much greater predisposition to be affected by continued fevers exists between the ages of fifteen and thirty-five, than at any other period; the forms of fever being generally of a more inflammatory and acute kind between these ages, and in the sanguine, irritable, and plethoric constitutions; whilst persons past the latter of these ages, and those of a lymphatic, leucophlegmatic, or melancholic temperament, are more liable to experience the lower grades of action. Scarcity, famine, and, consequently, insufficient and unwholesome nourishment, among the lower classes of the community, are the chief causes of the generation and spread of fevers, especially those of a simple, low, and infectious character. Whatever depresses or exhausts the vital and moral energies, exposes the body to the impression

of the exciting causes. The circumstances which produce this effect are fully explained in the article DISEASE (§ 21. 23. 27—36.), and in a previous section (§ 64.).

433. The disposition, also, which is generated by certain epidemic constitutions of the atmosphere and season should not be left out of consideration. A peculiar diathesis seems to be gradually and generally induced by the epidemic influence, whatever that influence may be in respect of its nature; and this diathesis or change of the vital manifestations of the organisation rapidly passes into febrile commotion upon the action of one or more of the exciting causes. The change thus effected in the diathesis, and increased by the impression of the exciting causes, may hence be viewed as the proximate cause, or earliest pathological state, of the disease; and to its continuance or non-continuance after the febrile action is fully developed, is often to be imputed the disposition or indisposition to relapse. This is more particularly the case in respect of the fevers caused by exhalations from the soil and from decayed vegetable matters. Infectious miasms—or the effluvia from the bodies of those in fever—suddenly and remarkably increase the morbid diathesis; but when the resulting disease has been undergone, the morbid diathesis is terminated, and a disposition to a return or relapse is altogether or nearly lost. Although epidemic states of the air thus do not favour relapses of infectious fevers, yet they greatly dispose the system to a first attack upon exposure to the exciting causes, when the diathesis has not been changed by a previous attack.

434. B. The exciting causes of continued fever are upon the whole much better known than the states of the system which dispose to their operation. They are extremely numerous; for whatever interests the vital energy so as to disturb generally its manifestations, and to occasion a morbid reaction, may be an exciting cause of fever.—It is unnecessary to enumerate even the most influential of them, as they are adduced with sufficient details, in the articles DISEASE (§ 55—63.), ENDEMIC INFLUENCES, INFECTION, and in an early section of this article (§ 65.). The chief causes of this class of fevers are—1st. Those which proceed (a) from the soil; (b) from its productions in a state of decay; and (c) from animal matter undergoing decomposition; either of these acting separately, or all of them conjointly;—2d. Animal miasms—(a) from healthy persons or animals crowded together, or confined in imperfectly ventilated situations, and without due regard to cleanliness; (b) from persons labouring under diseases of various kinds in confined apartments; and (c) from one or more persons affected by the disease which the effluvia propagates;—and, 3d. Changes taking place in one or more of the various functions, and which having reached a certain pitch, break out in open fever. Each of these requires a few remarks.

435. a. Emanations from the soil or its productions in a state of decay, are most frequently productive of periodic fevers; but they occasionally also give rise to continued fever, especially during certain states of season and temperature, and in plethoric and robust constitutions. What the conditions are, that occasion the continued, in preference to the periodic, type, cannot

kind, is produced. — *ζ. Previous disorder* heightens the severity of the disease, and necessarily determines its predominant features or complications, although sometimes in an indirect manner. Thus, it is common to observe bronchitis previous to, or attending the invasion of, fever, followed by a remarkable affection of the brain and of the mucous membrane of the intestines. In this case, the changes effected by respiration on the blood are imperfect; and, consequently, this fluid becomes morbid, — disordering first the functions and ultimately the structure, of the digestive mucous surface and brain.

440. *ii. DESCRIPTION.* — *Common continued fever* occurs in a simple and complicated form, presenting various grades of severity; the severe and complicated states passing into, or becoming identified with, varieties of the adynamic species. The severe states of common fever have been very generally imputed to its complications with inflammation of internal parts; but, although its complications are necessarily severe, yet it may be equally so without any evidence of local or predominant affection. This, however, is seldom the case. — I shall, therefore, first describe the simple form; and afterwards the more usual complications and states of severity.

441. *A. Simple Continued Fever — Simple Fever; Mild Synochus; Synochus mitior* — is usually preceded by the symptoms described above, as constituting — *a. The precursory stage* (§ 34.), especially by *lassitude*, and a general feeling of uneasy debility, and mental languor. The countenance is pale; the features sharpened, dejected, or anxious; and the pulse weak and small. — *b.* After an indefinite period, varying from two or three, to several days, irregular chills, rigors or shivering, commonly alternating with transient flushings or feelings of heat, are experienced, with the symptoms characteristic of the *period of invasion* (§ 35.). This stage is seldom attended by any actual coldness of the surface, particularly after it has continued a short time; the chilliness being accompanied by increased heat, constriction, and dryness of the skin. — *c.* With the disappearance of the chills, the period of *reaction* or of *excitement* (§ 36.), and all the phenomena associated with it, supervene. The vertigo, pains of the head, back, and limbs, and restlessness, usually present in the preceding stage, are increased in this. The patient complains of mental confusion and inability; of general uneasiness and restlessness; the countenance becomes full and flushed; the tongue white, foul, loaded, or furred; the heat of surface generally rises above 100°, and the pulse and respiration are fuller, stronger, and more frequent than natural; the pulse being commonly from 90 to 100 or 105 beats in a minute. The fever is now developed, and proceeds, as described above (§ 36.), usually for several days, — its duration varying from two, three, or four, days to as many weeks, until it either subsides in consequence of the treatment adopted, or passes off by means of some critical evacuation (*the period of crisis*), which most frequently occurs on one of the critical days, from the 3d to the 21st day from the time of invasion, or that in which chills or rigors were first felt. — The stages of *decline* and *convalescence* commonly advance in the manner stated above (§ 41, 42.).

442. This mild form of fever generally termi-

nates favourably, even when left to nature; but it may become complicated in its course, or pass into a state of dangerous, or even fatal, exhaustion towards the end of the second week, particularly in weak, aged, and exhausted persons. The return of the healthy functions is indicated — *a.* by the subsidence of the prominent morbid actions; — *b.* by the appearance of critical evacuations; — *c.* by a quiet and prolonged sleep, out of which the patient awakens refreshed, and partially restored; — and, *d.* by the other phenomena already enumerated (§ 41.), as indicative of a gradual decline of the disease. The transition to a severer form of fever is commonly owing to the occurrence of a predominant affection of the respiratory surfaces, or to the change induced in the circulating and secreted fluids, or to the affection of the digestive mucous surface, or to the circulation within the head.

443. *B. Severe or Complicated Synochoid Fever — Synochus gravior; Severe Synochus* — occurs from the same causes that produce the milder disease, either acting with greater intensity, or aided by additional circumstances. — The several stages may present a more severe affection of all the functions, than has been now described, without any very predominant lesion of a particular organ; but much more frequently some important viscus betrays increased disorder, generally of an inflammatory or disorganising kind. Yet this predominant lesion is not altogether identical with inflammation — certainly not with the inflammation primarily affecting healthy persons. It is less acute or intense as respects the symptoms attending it, more asthenic as regards the state of constitutional power, and more diffuse and sub-acute in its character, than common phlegmasia. It partakes of more of the features of the erysipelatous than of those of common or pure inflammation. Even when the local affection is more than usually phlogistic in appearance, still it is most important to recollect, especially as respects the treatment, that it is preceded and attended by a more or less severe constitutional disturbance, by lesion of the various manifestations of life, and by a change of the circulating and secreted fluids, — circumstances arising out of the poisonous influence of the febrile cause, and imparting the peculiar characters to this affection, — changing it from the true phlogistic or sthenic inflammatory condition, and determining, accordingly, the consequent lesions (§ 50.). Instead, therefore, of viewing the complication as the cause of the severity of the fever, we should rather consider the intensity of the morbid impression made by the febrile poison, and the resulting consequences, as the principal source of severity and of local affection, aided by the predisposed state of constitution, and of the viscus especially affected. — I shall describe the predominant lesions or complications of synochoid fever, in the order of their usual succession, and of their frequency.

445. *a. Synochoid fever with predominant affection of the bronchi and lungs.* — This is the most common, and generally the earliest, complication, although it frequently exists only in a slight degree. The bronchial surface is often more or less congested and irritated, and the structure of the lungs sometimes implicated. — This complication is not necessarily severe in

it may, moreover, be slight or sub-acute, or remarkably intense, and in all the intermediate degrees.—In the more *slight* or *sub-acute* forms, it constitutes the *Nervous Fever* of some writers; and, in the more *acute* and *intense* grades, the *Phrenitic* or *Brain Fever* of others.—The former of these very nearly approach, in their pathological states, the nervous variety of adynamic fever, denominated *Ataric* by PINEL, *Neuro-sthenic* by HILDENBRAND, and *Typhus mitior* by CULLEN.

449. α. Common continued fever, with predominant cerebral affection—the *Neuro-sthenic* of HILDENBRAND—commences, and proceeds for two or three days, as the simple or mild form of the disease. Either then, or at an earlier period, the patient usually complains of pain in some part of the head, most frequently in the temples and forehead, or in the occiput, extending down the neck. The pain is often constant and severe, but it is sometimes slight or entirely wanting; and it is commonly attended by throbbing of the carotids and temporal arteries, and flushings of the countenance. In those cases where no pain is felt, even upon shaking the head, the cerebral affection may not be less urgent and dangerous: but there is always, in those, a very early and remarkable giddiness, either with or without flushing of the face. Occasionally the pain and giddiness alternate, and the latter is always distressing when the former is absent. The expression of the eyes is either heavy and dull, or morbidly brilliant and animated. The conjunctiva is generally loaded, injected, and suffused, in the former case; and brighter and more glistening in the latter. But the eyes are always more or less sensible to light, the eyebrows contracted, and lids half closed upon exposure to it. Hearing and the general sensibility are also more acute. Noises and light invariably increase all the symptoms. The heat of surface is generally above the natural standard, especially over the head; but it is often not augmented on the lower parts of the body. The patient is watchful and restless, and the expression of his countenance indicative of suffering. In the less acute cases, the pulse, the thirst, the appearances of the tongue and of the evacuations, are nearly as in the simple form; and the symptoms generally continue, without alteration, for several days. An important change then occurs. In favourable cases, the slumbers, which were short and disturbed, or attended by a slight dreamy delirium, become quiet, profound, and refreshing. In unfavourable cases, the pain in the head changes to a dull, lethargic state, with a great diminution of the sensibility, and with increased injection and suffusion of the eyes. Delirium, if it have not already appeared, now comes on, attended by moaning or by incoherent muttering, during short and interrupted slumbers; the tongue is loaded, dark, and dry; and the thirst is diminished. In from one to three days, the insensibility passes into coma, unless a favourable alteration takes place; the pulse becomes very quick, and often rises to 120 or upwards; the strength sinks; and the tongue is more dry. To these succeed tremors, rolling of the head on the pillow, tossing of the hands, picking at the bedclothes, and the other dangerous symptoms consequent upon the more acute states of this complication. Even when this

unfavourable change has occurred, a stop may be occasionally put to its progress, although it generally pursues its onward course. A more tranquil and protracted sleep; subsidence of the delirium, or of the tremors, or of the frequency of the pulse; and a cleaner or more moist tongue, commencing at its edges, with an improvement in the appearance of the countenance, and in the state of the skin and of the excretions; are the usual indications of an arrest of the dangerous progress of the disease.

450. β. In the more acute states, the cerebral symptoms are severe, and their progress rapid, in proportion to the intensity of the local complication; the headach or giddiness, the intolerance of light and noise, and the general sensibility, being coordinately excessive. The pain in the back, loins, and limbs, is very great; the skin is often intensely hot, and pungent, particularly over the scalp, and is occasionally covered by perspiration, which is rarely copious or general; the eyes are injected, and suffused; the breathing is frequent and suspicious; the patient is anxious, uneasy, and remarkably restless; he rolls the head, and is wholly without sleep. The pulse is at first strong, full, or bounding; but generally devoid of the hardness characteristic of primary or pure phrenitis. Sometimes it is oppressed; and, in the most intense states of complication, it is often intermittent, slow, or not much above the natural frequency. Within four or five days, the pain passes into delirium and insensibility. The delirium is sometimes violent, and is then soon followed by tremors and insensibility; and these by subsultus tendinum. The insensibility increases, and passes into a drowsy lethargy; the delirium continuing, but becoming low and muttering. The patient may still become observant, and answer when roused; but coma supervenes, occasionally with rolling of the eyeballs or squinting, dilatation of the pupils, and falling of the eyelids. The tongue is now parched and brown; the gums and teeth are covered by a dark mucous sordes; the evacuations take place unconsciously and involuntarily; the respiration becomes irregular; the pulse either slow, or remarkably rapid and feeble, or intermittent; and life soon terminated.

451. Between these extreme states, there is every grade of intensity, the above symptoms being variously modified. In some cases, the cerebral affection is very insidious, and more or less slow; in others, open, manifest, and rapid. In the former it may be indicated only by giddiness and sickness or vomiting; the pulse in the carotids, and temperature of the head, not being affected. In a case of this description, which lately occurred in my practice (Mr. H. of Fitzroy Market), all the symptoms subsided instantly upon bloodletting.—It may thus exist nevertheless, although in a more protracted form, and present but few of the above symptoms, which, however, are most frequently observed, but not all of them in the same case. The various grades of this complication may be further associated with considerable bronchial affection, or with the disorder of the digestive canal about to be noticed. In such cases, the predominant lesion, either in the head, the thorax, or abdomen, frequently obscures the others, until the treatment, by subduing it, renders them more evident.

in any other. Yet it will be better to combine with it the more modern indication, of resorting to such means as may subdue the more urgent symptoms, and avert contingent danger. If the patient be seen as early as the *premonitory* and *invading* stages, the impending disease may be averted by the means advised above (§ 121, 122.)—more especially by *emetics*, warm *diaphoretics*, and the *vapour bath*. But when *excitement* has commenced, the treatment should be antiphlogistic. In this stage, we should endeavour, by a careful examination of the symptoms, to ascertain the existence of local complications; and, having determined their absence, the question will then be as to having recourse to *bloodletting*. I have already considered this topic so fully (§ 128—139.) that nothing further need be here advanced. If the nature of the prevailing epidemic, or the degree of reaction, require depletions, the earlier in this stage they are resorted to the better. But even then they require caution and discrimination. If the excitement be slight, and the patient neither robust nor plethoric, and more especially if the causes and circumstances connected with the origin of the disease be of a depressing nature, they will be better withheld.

458. The exhibition of *emetics* in the stage of excitement was advised by many of the ancients, and practised by some of the most recent writers, although objected to by others. The reason of this difference of opinion is very obvious. There are states, even of this stage, in which they will be of service, and others in which they will be injurious. When reaction is slight—when the patient is not plethoric, has not experienced full vomiting, and does not complain of pain or of tenderness in the epigastrium or hypochondria—then emetics may be exhibited. But if the excitement be great, with determination to the head; and if the patient have already vomited freely, and more especially if the symptoms just mentioned be present, they should not be prescribed. (See § 149.)

459. *Purgatives*, so much decried by Broussais, and with some justice as respects several states of fever prevalent in France, are certainly of very great service in the common continued fever of this climate, when employed with a cautious discrimination. Early in this disease, calomel, either with or without James's powder, may be given at night, and a purgative draught in the morning. At a more advanced stage, calomel, or hydrargyrum cum creta, may be conjoined with rhubarb. If the stomach be too irritable to retain the more common purgatives, a full dose of calomel will generally be retained; but its action should be promoted by enemata (see F. 140. 144.). During the febrile excitement, and when the bowels are sluggish, the stronger saline purgatives may be given in solution, in small doses, and at short intervals, with refrigerants (F. 440, 441.). The remarks already offered upon this subject (§ 150, 151.) will guide the practitioner as to the choice of purgatives, and the extent to which they should be prescribed. In this fever, especially, it can never be injurious to give them to the extent of freely evacuating morbid accumulations in the bowels, and of promoting the alvine secretions and excretions. When the *feces* are very offensive,

greater mischief will accrue from allowing them to remain, even for a short time, in the bowels, than from too active measures in evacuating them.

460. The remarks that have been offered above respecting *refrigerants* (§ 139, 140.), *diaphoretics* (§ 152.), and *diuretics* (§ 153.), are entirely applicable to this form of fever.—The *cold affusion*, which formerly attracted so much more, and now so much less, attention than it deserves, is more appropriate in this than in any other disease. This practice, although resorted to by the ancients and in Eastern countries, was but little known in this until it was employed by WRIGHT and JACKSON. The work of Dr. CURRIE on the subject first brought it into fashion; but now it certainly has not fashion in its favour. When the excitement is fully developed, and the heat of skin above the natural standard, when there is no sense of chilliness, and when the surface is hot and unperspirable, the cold affusion may be employed. Dr. CURRIE directed water of the temperature of from 40° to 60° or 70°, and preferred the hours from six to nine in the evening for its use. In cases of debility, the *cool* or *tepid* affusion is more appropriate. I have resorted to cold affusion over the whole body, in several cases of fever, in a warm climate; but I was not induced by its effects to entertain a high opinion of it. The affusion of cold, cool, or tepid water on the head, when this part is prominently affected, and cold sponging the surface, are more beneficial, and admit of more general application. Dr. CURRIE believed that the general affusion had the effect of lowering the pulse and the morbid heat, of inducing perspiration and sleep, and of cutting short the fever. I have never seen it succeed unequivocally in producing the latter effects; but have remarked that the excitement returned shortly after its use. In the complication with disease of any of the thoracic or abdominal viscera, it should not be used (§ 141.).

418. *B. Of the Complications.*—*a. Predominant affection of the head* has received attention above (§ 165.). What I have there stated is applicable to this complication of common continued fever.—*Bloodletting* is especially requisite, but its amount, and the mode of performing it, should entirely depend upon the symptoms and the stage of the disease.—The *cold affusion* on the head, and *purgatives*, are the next in importance. When the cerebral affection has been preceded or attended by diarrhoea, purgatives should be prescribed with caution. Rhubarb with hydrargyrum cum creta, given so as to evacuate morbid matters, and promoted by suitable enemata (F. 140.), will be then sufficient. When *delirium* is the principal symptom, care should be taken to discriminate accurately the states of vascular action and vital power. If it be unattended by increased heat of scalp, the pulse being very quick and soft, and the countenance sunk or pale, and especially if it have followed intestinal disorder, all lowering agents should be laid aside, and restoratives with opiates, and mild nourishment in small quantities, prescribed. When fever occurs in persons addicted to spirituous or other intoxicating liquors, the cerebral affection is apt to become very severe, and to be attended with delirium and often with

die increases in a still greater ratio. The predisposition also diminishes as we descend from puberty to infancy, and the mortality diminishes in a still greater ratio. Thus children and aged persons are least obnoxious to typhoid and infectious fevers: a somewhat different law here obtaining from that which characterises the operation of exhalations from the soil upon the human constitution; these latter affecting the young and old as well as the middle-aged, and renewing their attacks in various forms, whilst typhus fever seldom occurs oftener than once in the same person.

468. *b.* The exciting causes (§ 434.) of typhoid and synochoid fevers are often the same, excepting that infectious miasms, want and famine, the various contingencies connected with the operations of war, and epidemic influences, are most concerned in producing the *severer varieties* about to be described.—The *sporadic cases* of this fever, and which generally present either the milder form, or most of the nervous character, often originate in the depressing passions, in changes from the usual habits and modes of life, or in exposure to novel influences, physical and moral; in weak delicate persons of a lax habit of body; in persons imperfectly fed, or reduced by previous disease, or by exhausting discharges, &c. From these causes especially proceed the adynamic, slow nervous, or mild typhoid fevers, often observed in persons who have recently removed into large cities, or who live in crowded, low, and ill ventilated apartments.—The epidemic visitations of typhoid fever are usually of the more low or severe forms described hereafter.

i. MILD TYPHOID FEVER. SYN.—*Low Nervous Fever; Simple Typhoid Fever; Simple Adynamic Fever; Regular Typhus; Slow Nervous Fever*, Huxham; *Typhus mitior*, Cullen; *Febbris nervosa*, Auct.; *Languor Panonicus*.

469. *A.* This form of fever is characterised chiefly by great languor and debility; by giddiness, dulness, and confusion of intellect; by a soft, feeble, and quick pulse; and by loss of muscular power, sleeplessness, and low delirium. It usually commences with similar *premonitory symptoms* (*period of infection*, HARTMANN) to those above described. The patient complains of giddiness, lassitude, uneasiness at the epigastrium, of nausea and loss of appetite, of alternate chills and flushes, and of pain in the back and limbs,—the *period of invasion*. The chills are often prolonged, or recur for two or three days, but seldom amount to rigor. The skin afterwards becomes warm, but seldom very hot—the *period of excitement*, of *irritation* (NAUMANN), of *reaction* (HARTMANN), of *inflammatory irritation* (GOZDEN); the pulse frequent, full, soft, or weak; the countenance dull, pallid, and shrunk, or, occasionally, transiently flushed; the head heavy, confused, and giddy; the eye heavy and devoid of lustre; and the tongue loaded or covered with a dirty mucus. There are more or less thirst; a desire of cold, acid drink; sometimes pain at the epigastrium, nausea, and vomiting; or an irregular and relaxed state of the bowels; and offensive evacuations. Pain of the head is but little, or not at all, complained of, but that of the back and limbs is felt severely. *Tinnitus aurium* is generally present. Febrile uneasiness is great, the restlessness constant, and the want of sleep continued.—About the third, fourth, or fifth day, the head is more affected, and

the mind more confused. The respiration is short and quick; and torpor, or *coma vigil*, is often observed. Occasional flushes occur, in some cases, while the extremities are cool. The urine is pale, of a whey colour, or like small beer—occasionally scanty. The bowels are either torpid, or relaxed, or irregular; and deliquium, or faintness, partial sweats, tremors, &c. are complained of, on attempt to sit up. Delirium of a low kind, or consisting of a muttering incoherence, occurs about this time; generally, at first, during the night, but subsequently recurring during the day. The eyes become muddy, afterwards suffused or injected; and the tongue of a darker hue, dry or incrustated.

470. From the 7th to the 9th, 10th, or 11th day, the delirium degenerates into stupor—the period of *predominant narcotism* of NAUMANN—the *nervous stage* of HILDENBRAND—the *collapse* of CULLEN and HARTMANN; the pulse becomes small, weak, and very quick, or unequal; the heat of the skin natural, or diminished, or irregularly distributed; the hearing dull; and tremor, the supine posture, coma, and unconscious evacuations, are soon afterwards observed. Petechiae sometimes appear on the trunk, thighs, &c. The tongue becomes brown or black, incrustated and fissured, is protruded with difficulty, and the gums and lips are covered by a dark sordes.—From about the fourteenth day to a much later period, according to the character of the epidemic, the peculiarities of the patient, the severity of the early stages, and the state of internal organs, a favourable change very often occurs in all the symptoms—the *stages of crisis and decline*, or of *recovery*, (HARTMANN)—and is announced by a refreshing sleep, or by a warm and general sweat, or by a gentle diarrhoea; followed by subsidence of delirium, tremor, &c.; by the tongue being moist and clean at its edges, the skin more natural, and the pulse slower; by returning consciousness; and by the improved appearance of the countenance. If these changes do not take place; or if the sweats are cold and clammy on the extremities; or if they, or the diarrhoea, be unattended by amelioration of the symptoms; a *fatal change* should be dreaded, particularly if profound coma and great deafness, subcutaneous tendinum, or convulsive or spasmodic movements, difficulty or inability to swallow or to articulate, hiccup, involuntary evacuations, retention of urine, tympanitic abdomen, sliding down in bed; very rapid, fluttering, or intermittent pulse; very black tongue; and a quick, jerking, laboured respiration, or other unfavourable symptoms, appear.

471. *B.* The symptoms which distinguish this form of fever from the synochoid are—the greater prostration of strength from the commencement; the mental torpor and confusion of ideas; the long-continued chilliness, generally without rigor or shivering, at its invasion; the moderate increase of temperature afterwards, or its natural grade; the pallid and shrunk countenance, expressive of suffering and debility; the muddy, lack-lustre eye; the torpor, giddiness, and absence of pain in the head, passing into stupor with delirium at an early stage; the quick and small, or the full, open, and soft pulse, even during the period of excitement; the early dryness, and dark appearance, of the tongue; the remarkable

vital power is extreme from the commencement, and such as prevents the development, and, in some cases, even the least manifestation, of excitement. The causes of the disease have given vitality a shock beyond its powers of resistance, or of recovery. Muscular power is almost entirely annihilated, and the anxiety at the epigastrium and præcordia is extreme. Respiration is oppressed, and the pulse is quick, sometimes irregular, intermittent, or even slow, and always small, weak, and thready. The countenance and eyes at first have an intoxicated appearance: the former being pallid, occasionally slightly bloated, or livid and dingy; the latter being vacant or suffused, and, afterwards, injected, ecchymosed, half shut, or open. The skin, at an early stage, is warm or harsh; subsequently it is cool, withered, lurid, and, sometimes, studded with petechiæ or vibices; the extremities being cool, or even cold, and dingy, or of a leaden hue. The mind is very much confused at the commencement, and soon passes into a state of incoherence, delirious muttering, and coma. The patient is unable to protrude the tongue, owing to deficient power of the muscles of the organ; and seldom complains of thirst. The abdomen is tumid or inflated; the bowels being relaxed, the stools black and offensive, and, with the urine, passed unconsciously. The progress of the disease is usually rapid, and generally to a fatal termination; but the *premonitory stage* may be protracted, although severe — the *invasion* being sometimes sudden, and resembling an apoplectic seizure. If the powers of life rally, recovery may take place; but it is tedious, and often attended by various consecutive disorders.

478. *E. Of other Modifications or peculiar States of Typhoid or Low Nervous Fever.* — Various phenomena beside those already described may accompany this fever, according to the combination and intensity of the causes, the previous health of the patient, and the circumstances affecting him subsequently to the operation of the exciting agent. — *a.* When caused by *mental distress, despondency, &c.*, this fever presents certain peculiarities deserving notice. The patient is dejected, indolent, and incapable of exertion. He loses his appetite and strength; he cannot rest at night, or his sleep is disturbed and unrefreshing; and he complains of headach, and of many of the symptoms of a common cold. He is absent, his mind being constantly occupied with the subject of his misery. His countenance assumes an anxious appearance; his healthy looks vanish; and his absence of mind often passes into a state of reverie. After several days, manifest affection of the brain is observed, with characters varying with the age, strength, condition, and habits of the patient. In the robust, plethoric, and in persons addicted to intoxicating liquors, it is sudden and violent in its accession; the headach and despondency quickly passing into delirium of an active and constant kind — the patient calling out, or starting up, and attempting to get out of bed. The pulse is quick, firm, and oppressed, or small; sometimes soft or irregular. Muscular power is not so much, nor so early, reduced as in the other states of the disease, but there is continual jactitation. In the debilitated, the aged, or the ill-fed, the cerebral affection is

less violent in its attack, and commences more gradually, often attended by red or suffused eyes, or by catarrhal symptoms, or by diarrhoea; by delirium, tremor, great prostration of strength, hurried breathing, weak quick pulse, subsultus tendinum, and, sometimes, with a mottled appearance of the surface. In other respects, the progress of the disease is nearly the same as the more severe cerebral complications already noticed (§ 475.), but it much more frequently terminates unfavourably.

479. *b.* In some cases the fever is complicated with *sore throat*; and this symptom is occasionally so severe and early as to resemble an attack of *cynanche maligna*. Indeed, cases not infrequently occur, which fully indicate that the one disease may pass into the other, under favourable circumstances in respect of predisposition and concurrence of the exciting causes; or, in other words, that in young persons, in those predisposed to sore throat, and in cold and humid states of the air, certain of the exciting causes of typhoid fevers will sometimes occasion a malignant or putrid inflammation of the throat, ushered in and attended by this form of fever; or they will, in such or similar circumstances, produce a low fever, in which inflammation of the throat is a contingent complication, and assumes an asthenic or unfavourable character, owing to the depressed state of vital power, and morbid condition of the circulation, in which it occurs. This complication is observed either as the most prominent local affection, or in conjunction with some other remarkable disorder, especially with the gastric complication. In some instances, it is very severe; the pharynx and upper part of the œsophagus being also more or less affected, and deglutition altogether prevented.

480. *c.* *Paralysis* may occur, especially in the cerebral state of this fever; and, in this case, the use of one side of the body is generally lost. If the patient recover from the fever, the functions of the paralysed side are often gradually restored. This complication may take place in those cases which commence with protracted or severe premonitory symptoms, against which the patient struggles, until he falls down from exhaustion; or is *suddenly seized*, as in a case of apoplexy — the fever running its course, as after the usual invasion, with chills, rigors, vomitings, &c. When the disease is developed in this sudden manner, it commonly presents the cerebral character throughout, with delirium, passing into coma, &c. In a case, however, of this kind, the cerebral symptoms were subsequently slight, and the disease mild.* In some of the cerebral cases of this fever, the affection of the mind continues for some days, or even weeks.

* A young lady went some distance to visit an intimate friend, delirious in fever; and having gone into the chamber, she was sensible of a disagreeable odour upon the curtains of the bed being drawn. She soon afterwards complained of slight nausea, of headach, loss of appetite, and general lassitude. These symptoms continued gradually to increase for six days, during which time she kept about. On the morning of the seventh day she suddenly fell down without sense or motion. I saw her in this state soon afterwards, and, viewing the attack as the result of sudden congestion of the brain, and before I had learnt the above particulars, I prescribed a moderate bloodletting, and purgatives. The functions of the brain soon returned, and the fever ran its course in a mild form, and without delirium or prominent affection of any organ.

after the bodily functions are restored. Instances may even occur of permanent insanity being the consequence. But, in all such cases, hopes of recovery should be entertained until some weeks, or even months, have elapsed from the disappearance of the fever.

481. *d. Relapses* are not infrequent after the mild forms of typhoid fever; especially when the duration of the disease has been shortened by the treatment, or its course materially altered. They are also much more common in one epidemic than in another. In many instances, particularly when the procession of the morbid phenomena has been interrupted by large depletions, or drastic purgatives, the symptoms become ameliorated for a time, but recur with their previous severity; the recurrence being different from a relapse.— This fever, especially its gastric and enteric states, may pass, or be converted, into a low or typhoid form of *dysentery* (see that article, § 26, 27.), owing to the influence of the same circumstances that usually cause relapses; especially premature exposure in early convalescence; the use of too much, or of improper, food; the continued operation of the exciting causes; a close, impure, and infectious air; and suppression of the excretions.— *Local affections*, particularly *inflammations*, may also appear during convalescence, arising either from the above causes, or from atmospheric vicissitudes; or from whatever may inordinately affect the nervous and vascular systems. In these cases, the inflammation is apt to pursue a severe and rapid course, owing to the unfavourable or debilitated state of constitution in which it occurs. Bronchitis, often associated with affection of the substance of the lungs, and inflammation of the mucous surface of the bowels, sometimes with softening and enlargement, or ulceration, of the mucous follicles, are the most common diseases thus contingent on convalescence. Inflammatory affections of the stomach or liver may also take place. When the mucous surface of the intestines is the seat of consecutive disorder, the bowels generally are more or less relaxed, and the stools are of an ochrey hue, and offensive. In such cases, the follicles are especially affected; are often ulcerated; and, although they will generally heal under judicious treatment, perforation of the intestines and fatal peritonitis may be the result at a period more or less remote from the disappearance of the fever.

482. *F. Of Petechiæ and exanthematous Eruptions in Typhoid Fevers.*— Nervous or typhoid fevers may occur sporadically or epidemically, without any *petechial* or other eruption; or may be attended by *petechiæ* or *vibices* in their progress, and particularly at an advanced period, or by an *exanthematous eruption* at an earlier stage; or even by both kinds of cutaneous affection, either successively or almost coëtaneously. For many years, or in successive epidemics, or even in a single epidemic, typhoid fever may appear in any one or more of the states just described; or it may assume either of these forms, associated with one or other, or with both, of the affections of the skin just mentioned in a portion of the cases only; or the affection of the skin may be one of the most unvarying and chief characteristics of an epidemic: and, of the cases composing such an epidemic, some may be of

the mild, others of the complicated or severe form; some may evince more or less reaction or excitement, others may present depression of the powers of life and congestion, as prominent phenomena throughout. The above description, although applicable more especially to the occurrence of typhoid fever, independently of any marked affection of the skin, yet does not the less apply to the occasional association of the disease with this affection. Those epidemics, in which the changes in the skin are very constant phenomena, sometimes possess other characters, both in the early and in the advanced stages, that require an especial notice. Whilst these changes—both *petechial* and *exanthematous*—have been considered by HILDENBRAND, NAUMANN, FODÉRÉ, PEEBLES, and other experienced writers, as indications of specific kinds of fever, which, in the early stages, may present more or less either of inflammatory excitement or of depression of vital power; they have been viewed, by many authors, merely as occasional occurrences, or as modifications met with only in certain epidemics, and not as characteristics of distinct varieties.

483. In trying to solve this question, the same difficulties present themselves that arise in all attempts to arrange the different varieties and states of fever in such an order as the more constant phenomena may warrant, and as may conduce to appropriate and successful methods of treatment. If I refer to my own observations, in different parts of the Continent, some time after the late war, and in various parts of this country, both before and subsequently, I shall find—1st. That *petechiæ* and *vibices* were either seldom or rarely seen for several years, and in some epidemics, excepting in the most severe or malignant cases, or when favoured by a too stimulant treatment, and a too heating regimen, during the early stages; and that, at other times, they appeared more frequently in the advanced periods of the lowest forms of fever, and even, although much more rarely, towards the termination of synochoid fever, when antiphlogistic remedies had been neglected in the stage of excitement.—2d. That this change, in some epidemics, was a very common or even general symptom, occurring in mild as well as in severe cases, although presenting very different appearances in each; and that they were sometimes observed early in the low states of fever, particularly when caused by unwholesome and deficient food, by a foul atmosphere, or by infectious miasms.—3d. That they were very frequently connected, especially in the plethoric, in the previously unhealthy, and in persons using much animal food, with evident change of the circulating fluids, with predominant disorder of the digestive organs, with a soft, broad, and open pulse, and with hæmorrhages from the intestines, and a tendency to disorganisation of the mucous surface of the bowels.—4th. That an *exanthematous rash* or eruption was observed in some epidemics, from the third to the eighth day of the fever, was quite distinct from *petechiæ*, generally appeared earlier, and was, in some cases, either associated with, or succeeded by, *petechiæ* or *vibices*, or even both.—5th. That this exantheme was of a reddish colour, varying in deepness, and rarely passing to a dark hue; that it occurred in cases characterised by vascular reaction in the early stage, as well as in

those of a very low grade—in the mild, in the complicated, and in the severe; that this eruption was most probably overlooked in many cases where it existed; and that it was very generally confounded with petechiæ, owing to its late appearance, or to its colour changing, in a somewhat similar manner to petechiæ, with the states of vital power and of the circulating fluids.—6th. That although the difference between both these affections of the skin has been insisted on by HILDENBRAND and NAUMANN, it has been too widely drawn by them, and without due reference to the occasional association of both affections. From these facts, therefore, I am induced to come to the conclusions above stated (§ 482.); and, conformably with the views of the experienced writers just mentioned, to notice more particularly the states of fever in which these changes in the skin are observed, without considering these states as always constituting distinct species.

iii. TYPHOID FEVER, WITH PUTRO-ADYNAMIC CHARACTERS. SYN.—*Putro-adynamic Fever*, *Σύνοχος μὲτα σπυρίδνης*, Galen; *Synochus Putris*, S. cum Putredine, *Febris continua Putrida*, Rivière; *F. continens Putrida*, Selle; *F. Putrida sanguinea*, Vogel; *F. colliquativa putrefaciens*, Quesnoi; *F. Hungarica*, *F. nervosa-putrida*, *F. asthenica*, *F. contagiosa*; *F. colliquativa essentialis*, Borsieri; *F. Putrida simplex*, Richter; *F. caractere putrido aut septico*, Hildenbrand; *F. Petechialis*, *F. Nosocomialis*, *F. Castrensis*, *F. Purpurata maligna*, *F. Maligna*, *F. Carceraria*, *Pestis Bellica*; Auct. var.; *F. Continens maligna*, Huxham; *Das Faulfieber*, *Faulige Fieber*, Germ.; *Fièvre grave*, *F. Maligne*, *F. Putride*, F1.; *F. Adynamique*, Pinel; *Febbre Putrida*, Ital.; *Morbo Petechiale*, Cerri; *Febbre Petechiale*, Rossi; *Febbre epidemica Petechiale*, Buffa; *Petechial Typhus*, *Camp Fever*, *Jail Fever*, *Putrid Fever*, *Putrid Malignant Fever*, *Spotted Fever*.

484. Conformably with what I have stated above, I consider this as a variety merely of typhoid fever; its especial characteristic—the appearance of petechiæ and vibices—being contingent upon certain circumstances and causes tending to contaminate the circulating fluids, and to destroy the tonicity and irritability of contractile tissues, and appearing only as the effect of a series of anterior changes. Although petechiæ may occasionally appear in the advanced stages of other fevers, particularly those of the typhoid form, yet in those epidemics which result from famine, war, unwholesome food, and from air loaded with putrid animal and vegetable matter, or with the emanations proceeding from a number of persons shut up in a close atmosphere—causes which are often conjoined—this symptom is very generally, if not constantly, observed, and is only one of the indications of the very serious changes which have taken place, not only in the blood, but also in the soft and irritable structures of the frame. Infection, either directly or by fomites, is, however, the chief cause, although cold, humidity, fear of the disease, and the other agents just noticed, may either generate the fever *de novo*, or predispose the system to infection, or aid its operation after exposure to it. Although certain epidemics evince a putrid or septic character at an early period, and thereby justify the appel-

lation generally given to them; yet this character is seldom primary, or otherwise than the consequence of suppression or exhaustion of vital power, the fever commencing in some one of the forms already described. Indeed, there is no variety of fever that may not evince a septic or putrid state—1st, from the vital depression produced by the exciting cause; 2dly, from exhaustion consequent upon vascular reaction; 3dly, from the passage of contaminating matters into the blood; and, 4thly, from these states conjoined. Hence, when the causes are of a contaminating kind, and the influences continuing to operate after infection have a similar tendency, putrid or malignant symptoms will arise, whether the fever be synchoid, nervous, typhoid, or gastric, in its early periods. These fevers are the most prone to the septic character; but others, as remittent, inflammatory, and bilious fevers, may also assume it. This particular character may, or may not, be developed, or may appear at a later or earlier period, owing to the nature and diversity of the causes; to the condition of the internal functions and of the circulating fluids at the time of attack; to the rigidity or tone, or to the laxity, of the softer solids; to the violence or absence of vascular reaction; and to the early treatment and regimen.

485. A. Petechial, or putro-adynamic fever, generally commences with the premonitory and invading symptoms usually observed in other fevers of a low grade. When an epidemic presents changes of a septic or putrid nature, as predominant features, the early stages of the fever vary most remarkably according to the intensity of the causes, and the state of the patient. The period which elapses from infection till the manifestation of the disease ranges from a few hours to five or six weeks. It is commonly some days, but sufficient evidence has been furnished, in the Irish and other epidemics, that the longest of these periods may occur. During the time the disease thus takes to form, the usual premonitory symptoms are observed, and increase until chills, horripilations, or rigors are felt. In some instances the disease commences insidiously, with or without catarrhal symptoms, becoming gradually severe and dangerous. In these, it is often difficult to assign the exact period of attack. Fatal cases most frequently begin in this manner, especially in the plethoric, cachectic, and persons accustomed to full living. In others, after a protracted and severe premonitory stage and indistinct symptoms of invasion, the fever proceeds with indications of imperfectly developed reaction, and soon assumes a putrid or malignant form. In some cases, rigors and shiverings sufficiently evince the period of attack, and quickly give rise to inordinate reaction, followed by exhaustion and evidence of change in the fluids and soft structures. Amongst the most constant of the early symptoms are—dull pains in the head, occiput, back, and limbs; universal weariness, soreness, and loss of muscular power; confusion of mind; pains in the joints and limbs resembling rheumatism; frequent sighing; nausea or vomiting, and noises in the ears.

486. The pulse, when reaction is developed, is full, open, quick, sharp, but soft and easily compressed. Respiration is laborious, suspirious, with oppression or anxiety at the præcordia and epigas-

particularly when the petechiæ, or vibices, are of a dark, or deep purple colour; the abdomen tympanitic; and the stools are green, livid, or black, mixed with dark fluid or grumous blood. In these, fatal hæmorrhages sometimes occur. The dysenteric state may take place in mild as well as in severe cases, at an advanced stage; with severe gripings, and dark sanious, bloody, and mucous stools, which are very foetid and infectious. The disease may thus pass into the adynamic form of dysentery. This change was common in the epidemics lately prevalent in Ireland. — *d.* The complication with inflammation of the *fauces* and *pharynx*, or with putrid sore throat, is sometimes observed, and is to be distinguished from primary *cynanche maligna*, by its occurrence in the course of the fever, or as a contingent affection (§ 479.).

492. The *sequelæ* of this fever are sometimes serious. They consist chiefly of dysentery, chronic diarrhœa, dropsies and œdematous swellings of the extremities, pulmonary consumption, hepatic obstructions, mania and other forms of insanity, abscesses in various parts of the body, sloughing sores, inflammation of veins, particularly of those of the extremities, gangrene of the feet, rheumatic affections, &c. Most of these result in great measure from the changes that have taken place in the blood during the fever; these changes affecting the blood-vessels, and organs most susceptible of congestion. — *Relapses* are frequent in cases of short duration, and in those which have been apparently cut short by active treatment; and are generally more dangerous than the first attack. They are more common in males than in females; and towards the close of an epidemic, than at its commencement.

493. *D. Diagnosis, or the Changes which more especially constitute Malignancy or Putro-Adynamia in Fevers.* — *a.* The *secretions*, next after the state of vital power, indicate incipient dissolution of the vital cohesion of the blood and soft tissues. — The *urine* has first a more viscid and albuminous appearance than usual. It is frothy, browner, and less transparent. If this pathological condition increases, the urine becomes brown, or dark brown, clouded, turbid, muddy, and often deposits a brown sediment. It quickly becomes putrid or offensive. — The *feces* are foetid, or have a putrid smell — are dark, fluid, ochrey, or contain blood. — The *sweat* is thick, clammy, sometimes cold, copious, and always offensive; and occasionally it imparts an ichorous stain to the linen. — The secretion poured into the mouth is a thick, viscid, slimy, dirty mucus, of a dark brown colour, that collects over the teeth, edges of the tongue, and lips.

494. *b.* The changes observed in the *vascular system* are — an open, broad, soft, compressible, undulating, or unequal, or a very quick, small, thready, and irregular pulse; a more than usually dark appearance of the superficial veins, or dark streaks in their course; and, at an advanced stage, exudations of dark, dissolved, or thin blood, or of a bloody sanies, from the outlets of canals, as the mouth, nostrils, anus, vagina, &c. — Blood taken from a vein, even previously to the occurrence of these signs, is very dark, thin, sometimes of a black purple hue; and either does not separate into coagulum and serum, or coagulates into a soft, pultaceous, or gelatinous

mass, with imperfect separation of the serum. The fibrinous and albuminous constituents are deficient; and, owing to this circumstance, together with the want of vital power in the vascular system, the coagulum wants cohesion, the least agitation causing a partial admixture of red particles in the surrounding serum. — As the dissolution of the vital cohesion of the circulating fluids and softer solids proceeds, the colouring particles of the blood often fall to the bottom of the vessel, or of the gelatinous coagulum, leaving the upper stratum, and the surrounding serum, of various shades — sometimes of a greenish, purplish, or reddish hue. LANGRISH, HUXHAM, FORDYCE, HILDENBRAND, and others, have noticed a peculiar putrid odour of the blood when taken from a vein. (See BLOOD, § 110. et seq.). This fluid soon undergoes putrefaction after its removal from the body. It presents, however, various anomalies, in particular cases, or in some epidemics; but it seldom evinces very remarkable alterations, excepting as the grosser and more palpable results of anterior changes, which, although evidently of a most important kind, admit not of precise recognition; nor do those alterations occur until the symptoms indicate depression of constitutional power, imperfect assimilation of absorbed fluids, and lesion of the depurating functions. In connection with these changes, particularly those of the blood, the tonicity, or vital cohesion, of the extreme capillaries and softer solids are very much impaired, occasioning thereby further alterations. The functions of the cerebro-spinal nervous system are often more or less disordered, as in low nervous fevers; and the states of the mucous and cellular tissues, and of the skin, are remarkably altered. The cellular tissue becomes flaccid, softened, or less coherent, and consequently slightly tumid; and hence the bloated appearance in extreme cases; or cachectic fulness of the surface, in the most fatal states of the disease. The mucous tissue is discoloured, it exhibits a dirty brown, or grey, or livid hue, with black ecchymosed spots.

495. *c.* The *cutaneous surface* is at first merely dusky or lurid. But as vital power is further depressed, a bluish, marbled discolouration is sometimes observed in the shape of veins. Petechiæ of various depths of shade, from a lively or dark red, to a purplish or brown colour, appear principally upon parts usually covered by the clothes. They are either alone, or attended by the exanthematous eruption characterizing the variety next to be noticed (§ 497.), or by dark or purplish spots of various sizes. In some cases, the skin, especially that of the extremities, becomes of a dark purple colour. When there is much heat of surface in the early stage of excitement, a caustic or morbid sensation is imparted, which increases whilst the hand remains in contact with it. When copious sweats follow, a white miliary eruption, intermingled with petechiæ, or vibices also, sometimes is observed. As the temperature is reduced, an unpleasant raw, cadaverous, or cold feeling is imparted to the hand of the examiner; and the petechiæ often become much darker, or more numerous, or aggregated, or almost confluent in some parts. In such cases, *passive hæmorrhages*, particularly from the bowels, are not uncommon; but they may also occur without much change in the skin. The

without petechiæ or any marked putrid symptom. It may, as shown by HILDENBRAND, be simple, or variously complicated; and, as remarked by Dr. PEEBLES, it may be benign throughout, or assume a malignant character, according to individual diathesis, the nature of the prevailing epidemic, or the mode of treatment. It generally presents itself as an epidemic, is contagious, and runs a uniform course, unless predominant affection of some internal organ modifies its course or prolongs its duration.

500. It has been shown above, that the *petechial affection* consists of minute stains or ecchymoses, caused by the transudation of blood from the minute capillaries of the vascular *rete* of the skin, owing to the atony of these vessels, and the alteration of the blood; that it may occur in the advanced stage of any fever, even of the more inflammatory or purely eruptive, when converted into an adynamic or typhoid state, by improper treatment or the peculiar condition of the patient; and that it is not, in any sense of the word, an *eruption*, as it has been very improperly denominated by some writers. This change in the skin, which has been viewed as one of the chief indications of incipient putridity, or of a septic tendency, is very different from the eruption characterising typhus. The *petechiæ*, or cutaneous ecchymoses, vary in dimensions from minute *stigmata* to large patches or *vibices*, and in the deepness or shade of colour. They very rarely appear at the commencement, even of the more putrid or malignant fevers, unless from peculiar depravity of constitution, or from causes affecting more especially the circulating fluids — as imperfect nourishment, unwholesome food, or other injurious ingesta.

501. But the *exanthematous eruption* attending true typhus, is as characteristic of it as the eruptions of measles or of scarlatina; and, although observed by numerous writers, it has been confounded with petechiæ, with which it is often associated in the advanced stages of the fever, or with miliary eruptions. — HILDENBRAND gave a description of it, as it appeared in the contagious fevers prevalent in Germany during the commencement of the present century; and Dr. PEEBLES has recently described it accurately and minutely, and as he saw it in Italy soon after the war. His description agrees with my own observations about the same period. This eruption appears in the early progress of a fever produced by human effluvia, when circumstances occur to promote them, or to prevent their dissipation. The animal miasm, whether generated by numbers crowded in a small space and confined air, or proceeding from a person affected by the disease, should be viewed as a poison, affecting the human body in a specific manner, and causing fever with an eruption of a certain form, which propagates itself by the diffusion of a morbid effluvia in the surrounding air, or by its retention in various animal productions or porous substances when shut up from the air.

502. This eruption usually appears from the third to the seventh day of the fever, but it may be delayed till the twelfth or fourteenth day. It is of a florid, reddish, or reddish pink colour; disappearing on pressure, but soon returning when pressure is removed. This circumstance is sufficient to distinguish it from petechiæ. The more exuberant

resembles the measles, and has been mistaken for them; but it is more papillar, and rougher to the touch, being sensibly elevated to the eye; and, although sometimes grouped or crowded, it does not coalesce so much as measles, but each papilla is more or less separate. It is sometimes vesicular, and followed by desquamation of the cuticle. It is occasionally indistinct, and may be then overlooked, and it sometimes approaches more nearly the miliary eruption. Hence it has been mistaken for this eruption in such cases. It is generally confined to the trunk of the body, the arms, and thighs; but it may cover nearly all the body. It rarely extends over the face or hands. In children, it appears only upon the trunk, or parts of it, and often scantily. It is sometimes evanescent, disappearing in one part of the day and returning in another (*Præles*). It may be copious in some cases, and scanty in others, even in the same family. Owing to these circumstances, it may escape observation. It is not liable to recede early in its course; but if it disappear from injudicious treatment, or a faulty state of the system, malignant symptoms are apt to supervene.

503. In some cases, the interstices of the skin between the papillæ are red or erythematous. In these, there are also increased suffusion of the eyes, redness of the tongue at the point and edges, redness of the fauces, as in mild scarlatina, and subsequent desquamation of the cuticle. The duration of this eruption is from three to five days. When the exantheme is slight, it disappears without leaving discernible marks; but when it is exuberant, stains are left in the situation of the papillæ. If petechiæ occur in this fever, they seldom are observed before the eighth or tenth day, and then this eruption has usually disappeared. When the petechiæ are earlier, or the eruption continues longer, so that both exist together, they are quite distinct and different in their appearances; for the latter is never so dark or livid as the former generally is, and the petechiæ are not attended by the elevation of the cuticle and roughness characterising the eruption. The stains left by an exuberant eruption generally become livid when petechiæ are present; but the eruption itself does not assume a dark tint, as long as it retains its papillar form. In the more malignant cases, and when petechiæ appear early in the disease, the colour of the eruption may, however, become deeper, or may change with the alteration in the fluids and softer solids.

504. *A. DESCRIPTION.* — True typhus proceeds in a more regular and determinate manner than synchoid or nervous fevers; and presents the several stages into which I divided fever, when treating of it generally. The *premonitory stage* exhibits the same symptoms as are observed to announce other fevers, and varies much in duration. HILDENBRAND states from three to seven days; but a much longer time may elapse from the time of infection to the occurrence of the *stage of invasion*. This period is the commencement of the febrile paroxysms. It begins with a creeping sensation over the head and back, followed by shivering, paleness of the surface, the cutis asserina, intervening flushes of heat, heaviness or giddiness of the head, and the usual symptoms of this stage. After a few hours — seldom more than twelve — the *stage of reaction* — the inflammatory of HILDEN-

posed.—*a.* The *anomalous phenomena* observed in the *stage of invasion*, are few. The shivering may be so slight as hardly to be observed, the fever seeming to begin at once with increased heat; or the rigors may last or return at intervals during some days.—In the *period of reaction*, the modifications are often more numerous and striking. The inflammatory character of this stage is often greatly increased; sometimes as respects the violence of the general symptoms, but at others with severe local affection. When the *head* is the seat of prominent action, the delirium may be phrenitic, maniacal, or the stupor may amount to apoplectic sopor. Inflammation may take place, either in the *lungs*, or in the *liver*, or in the *digestive mucous surface*, and be so fully developed as to resemble idiopathic disease of these viscera, if the previous fever, stupor, tinnitus aurium, and peculiar eruption, did not establish the difference between them.—*Bilio-gastric* affection, also, may be so prominent as to simulate that form of fever. But the stupor and typhomania will assist the diagnosis, should the eruption be so slight as to escape observation. The *nervous* character may show itself prematurely; especially when the vital powers are weak, depressed, or speedily exhausted. In these, *septic* or *malignant* symptoms may occur. In some cases, the inflammatory stage may continue to the ninth or even to the eleventh day.

508. *b.* In the *nervous stage*, various modifications are also observed. Local affections may continue through the greater part of this stage, or may even first appear in it; particularly those seated in the intestines, and implicating especially the mucous follicles. Diarrhœa, or typhoid dysentery, may thus supervene, and be either slight, severe, or fatal. The former of these affections is caused by vascular determination to the intestinal mucous surface, consequent upon the subsidence of the eruption, and by the unhealthy bile secreted by the irritated liver from the impure blood circulating in it. The dysenteric symptoms are owing to the morbid action going on in the lower part of the ileum, in the cæcum, and large bowels. Lumbrici are sometimes passed. But the principal and most frequent variations consist in the appearance of numerous *petechiæ* and *vibices*, or in their increase or deeper hue, if they had previously been observed, with several other putro-adyynamic changes. In these, the nervous symptoms may not be more remarkable than in milder cases; or these symptoms may be very prominent, either with or without the occurrence or aggravation of the malignant or septic state. Miliary eruptions may also appear in this stage. In the more unfavourable cases, the tongue may be shrunk like a piece of burnt leather, the heat of surface excessive, the diarrhœa exhausting, the distension of the abdomen great, and pains in the bowels severe. Muscæ volitantes, picking of the bed-clothes, constant muttering, spasmodic affections, stiffness or cramps of the extremities, paralysis of the eyelids or tongue, horror at liquids, may also occur. A black coating of the tongue and teeth; fœtor of the breath, stools, and of the body; dark petechiæ or vibices; ecchymoses or bluish patches; passive hæmorrhages, and even carbuncles, may appear during this stage, particularly when circumstances concur to produce putrid or septic changes in the course

of the fever. These severe cases, if they are not fatal before the fourteenth day, often run on to the seventeenth, twenty-first, or twenty-eighth day, and generally end in death.

509. *c.* Sometimes the *precisis* on the seventh day either does not take place, or is not followed by any alleviation, or is attended by aggravation of the symptoms. If a decisive crisis take not place on the fourteenth day, it rarely happens till the twenty-first; a crisis between these days being seldom effective. When death occurs, the fatal change is either premature or procrastinated. The symptoms accompanying a crisis are often variable. Changes in the urine cannot be depended upon. Discharges from the bowels are often copious, without benefit; and if they continue so without alleviation of the symptoms, or are unnatural, ulceration of the intestinal mucous surface may be dreaded. A critical sweat is sometimes wanting, the patient recovering nevertheless.

510. *d.* The *decline* of the disease may be protracted, but never shortened; and attended by various symptoms, as a continuation of the stupor, nightly recurrence of delirium, or lingering affections of some one of the thoracic or abdominal viscera. A new disease, of an inflammatory kind, may occur during the stages of decline and convalescence, or tubercular consumption may supervene; and *relapses* are not infrequent in the latter period, owing to a fresh infection.—*Recovery* may be retarded by the severity of the complications, by want of sleep, by errors in regimen, and by the depressing passions.

511. *e.* The foregoing modifications refer entirely to aggravating circumstances; but some cases are so slight, that the patient scarcely keeps his bed—a trifling degree of stupor, with scanty eruption, and occasional pains in the bowels, constituting the chief complaint. In the more benign cases, a decisive crisis occasionally takes place as early as the eleventh, or even the ninth, day; but *relapses* are liable to follow, if the patient be exposed to a re-infection.

512. *v.* PROGNOSIS OF TYPHOID FEVERS. The prognosis will be influenced by the appearance of any of those phenomena to which attention has been directed above (§ 434.). But in addition to these, the practitioner will take into the account the previous condition, the *age*, and the *sex* of the patient; the nature of the prevailing epidemic; and the influences continuing to operate during treatment. As to the manner in which *age* should affect the prognosis, from the beginning, some very interesting facts have been adduced by Dr. ALMON, who has given the following table in illustration of the comparative prevalence and mortality of typhus at different ages, as observed in his practice:—

	Cases.	Deaths.	Proportions.
Under 15 years	83	2	1 in 41½
15 to 30	149	11	1 in 13½
30 to 50	93	17	1 in 5½
Above 50	17	7	1 in 2½
Total	342	37	1 in 9½

Of these 342, there were 170 cases of simple or mild typhus, in which only three deaths occurred; 79 cases presenting prominent affection of the head, and in these 21 were fatal; 58 cases with affection of the pulmonary organs, in which 13 were fatal; and 35 with abdominal affection, in

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518. *a.* A fatal issue is evidently caused, or accelerated, in some cases, by the severity of the associated disease of the respiratory organs, preventing the necessary changes from being effected in the blood circulating in the lungs. It proceeds in others chiefly from the influence of the morbid blood upon the weakened irritability of contractile tissues, and particularly of the heart; and, in rare instances, from perforation of the intestines inducing general peritonitis, which soon exhausts the remaining powers of life. The lesions of the digestive mucous surface evidently assist in producing this effect; but in a much less degree than the depression of organic nervous power and of irritability, and the deteriorated state of the blood, with which they are intimately connected, and of which they are important effects. All these internal lesions evidently commence in the course, or even not until the advanced stages, of the disease; and, when developed, are analogous to the sphacelated sores and other alterations which take place in external parts in the more malignant cases. These internal as well as external lesions depend upon the anterior changes in the organic nervous power and irritability, and in the blood; they present similar characters; and, where even the slightest external lesions are observed, the existence or occurrence of those that are internal is to be feared. The most constant of these latter are discolouration and diminished cohesion of the intestinal tunics, distension of the intestinal tube by flatus, and enlargement and ulceration of the follicles, with inflammation or engorgement of the mesenteric glands. There are various other lesions associated with those; but they are different in different cases.

519. *b.* Since PETIT and BRETONNEAU directed attention to the almost constant change in the *intestinal mucous follicles* in typhoid fever, the subject has been further illustrated by the researches of LOUIS, ANDRAL, BRIGHT, CHOMEL, and others. But, although this lesion is so constant in the low fevers occurring in Paris and some other parts of France, it is certainly not so frequent in the same states of fever in this country; and, instead of viewing it as intimately connected with the nature of these fevers, I consider it as only one of several changes superinduced in the progress of the disease, but one of the most constant and important. The first alteration which these follicles present is enlargement or engorgement, owing to the formation under the mucous coat of a yellowish-white matter, slightly friable, which imparts to the agminated follicles the appearance of a thickened patch, and to the isolated follicles that of a pustule. To this state, which is generally preserved till the twelfth or fifteenth day, succeeds, in most cases, ulceration, beginning either in the mucous surface and extending to the whitish matter, or in this latter, which becomes softened and detaches the mucous coat from the parts underneath. These grades of lesion in the follicles almost constantly commence nearest the ileo-cæcal valve. From the

eighth to the fifteenth or twentieth day, the agminated patches, which have not experienced the above changes, present a reticulated appearance; their mucous covering being of a deeper colour than natural, softened, partially detached, and perforated by numerous orifices of enlarged follicles. In proportion as these patches disappear by ulceration, or by sphacelation, the margins of the ulcers become either more level, evincing a disposition to cicatrization, or more elevated, owing to thickening of the submucous and muscular tunics. The ulceration generally extends in width and depth, and successively invades the submucous, muscular, and serous coats; ending at last in perforation; but death most frequently takes place before this last change occurs. Evidence of cicatrization is, in rare instances, observed, when the disease has been of long duration. Ulceration does not attack all the patches containing the enlarged glands; for resolution sometimes takes place, or absorption of the matter they contained.

520. *c.* The *mouth tongue*, and *pharynx* are frequently covered with a thick mucus, underneath which the mucous coat is often not manifestly altered. But in some cases, this coat is softened, discoloured, and studded with a few small round or oval ulcers, most of them not referrible to the follicles. The *æsophagus* occasionally is excoriated or slightly ulcerated. The *stomach* is variously coloured in its internal surface. It is sometimes pale, most frequently red in various grades, or purplish or brownish red, occasionally yellowish; and often the parts of the organ in contact with the liver and spleen have imbibed the colour of these viscera.—*Softening*, or diminished cohesion, of the mucous and submucous tissues, throughout the greatest part of the large curvature, or even the whole of the stomach, is observed in a large proportion of cases. The softening seldom extends to all the coats. Sometimes the mucous tunic is not only softened, but entirely destroyed, the cellular tissue or the muscular coat being denuded. It is generally easily detached from the subjacent parts. M. CHOMEL found, of forty-two cases, more or less extensive softening in fourteen. He remarks, that he observed softening of the internal coats of the stomach in the same proportion of fatal cases from small-pox.—*Thickening*, and great *tenuity* of the mucous coat, have also been seen but not so frequently as softening. Although M. LOUIS met with ulceration of the mucous membrane of the stomach in four cases, and M. ANDRAL in ten, yet M. CHOMEL did not find one instance in the forty-two inspections, of which he has given the details.

521. *d.* The *duodenum* and *jejunum* have occasionally imbibed the colour of the bile or of adjoining viscera. They are generally of a deeper red than the rest of the intestines. The *ileum* is usually more or less red, with numerous arborizations on the external surface; but more frequently the redness is seated chiefly in the mucous coat, and particularly in the margins of the *valvæ conniventes*. In many cases, the redness is disposed in zones, between which the three coats of the intestine present a remarkable pallor. The redness and injection are not greater around the ulcerations and tumid patches of agminated follicles, than in other parts. Alterations of colour are not so common in the *large*, as in the *small*

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519. *b.* Since PETIT and BRETONNEAU directed attention to the almost constant change in the *intestinal mucous follicles* in typhoid fever, the subject has been further illustrated by the researches of LOUIS, ANDRAL, BRIGHT, CHOMEL, and others. But, although this lesion is so constant in the low fevers occurring in Paris and some other parts of France, it is certainly not so frequent in the same states of fever in this country; and, instead of viewing it as intimately connected with the nature of these fevers, I consider it as only one of several changes superinduced in the progress of the disease, but one of the most constant and important. The first alteration which these follicles present is enlargement or engorgement, owing to the formation under the mucous coat of a yellowish-white matter, slightly friable, which imparts to the agminated follicles the appearance of a thickened patch, and to the isolated follicles that of a pustule. To this state, which is generally preserved till the twelfth or fifteenth day, succeeds, in most cases, ulceration, beginning either in the mucous surface and extending to the whitish matter, or in this latter, which becomes softened and detaches the mucous coat from the parts underneath. These grades of lesion in the follicles almost constantly commence in those nearest the ileo-cæcal valve. From the

eighth to the fifteenth or twentieth day, the agminated patches, which have not experienced the above changes, present a reticulated appearance; their mucous covering being of a deeper colour than natural, softened, partially detached, and perforated by numerous orifices of enlarged follicles. In proportion as these patches disappear by ulceration, or by sphacelation, the margins of the ulcers become either more level, evincing a disposition to cicatrization, or more elevated, owing to thickening of the submucous and muscular tunics. The ulceration generally extends in width and depth, and successively invades the submucous, muscular, and serous coats; ending at last in perforation; but death most frequently takes place before this last change occurs. Evidence of cicatrization is, in rare instances, observed, when the disease has been of long duration. Ulceration does not attack all the patches containing the enlarged glands; for resolution sometimes takes place, or absorption of the matter they contained.

520. *c.* The *mouth tongue*, and *pharynx* are frequently covered with a thick mucus, underneath which the mucous coat is often not manifestly altered. But in some cases, this coat is softened, discoloured, and studded with a few small round or oval ulcers, most of them not referrible to the follicles. The *æsophagus* occasionally is excoriated or slightly ulcerated. The *stomach* is variously coloured in its internal surface. It is sometimes pale, most frequently red in various grades, or purplish or brownish red, occasionally yellowish; and often the parts of the organ in contact with the liver and spleen have imbibed the colour of these viscera.—*Softening*, or diminished cohesion, of the mucous and submucous tissues, throughout the greatest part of the large curvature, or even the whole of the stomach, is observed in a large proportion of cases. The softening seldom extends to all the coats. Sometimes the mucous tunic is not only softened, but entirely destroyed, the cellular tissue or the muscular coat being denuded. It is generally easily detached from the subjacent parts. M. CHOMEL found, of forty-two cases, more or less extensive softening in fourteen. He remarks, that he observed softening of the internal coats of the stomach in the same proportion of fatal cases from small-pox.—*Thickening*, and great *tenuity* of the mucous coat, have also been seen but not so frequently as softening. Although M. LOUIS met with ulceration of the mucous membrane of the stomach in four cases, and M. ANDRAL in ten, yet M. CHOMEL did not find one instance in the forty-two inspections, of which he has given the details.

521. *d.* The *duodenum* and *jejunum* have occasionally imbibed the colour of the bile or of adjoining viscera. They are generally of a deeper red than the rest of the intestines. The *ileum* is usually more or less red, with numerous arborisations on the external surface; but more frequently the redness is seated chiefly in the mucous coat, and particularly in the margins of the *valvula conniventes*. In many cases, the redness is disposed in zones, between which the three coats of the intestine present a remarkable pallor. The redness and injection are not greater around the ulcerations and tumid patches of agminated follicles, than in other parts. Alterations of colour are not so common in the *large*, as in the *small*

525. *g.* The importance of the lesions observed in the *respiratory organs* has been alluded to. The *epiglottis* has been sometimes seen oedematous. M. CHOMEL found it ulcerated, with denudation of the cartilages, in three cases out of twenty which were carefully inspected. The *larynx*, especially its superior aperture, is occasionally also the seat of ulceration. When ulceration is observed in either of these situations, it often also exists in the *pharynx*, in which it seems often to have begun; and it is generally found to consist of several small but deep ulcers, commencing in the form of pustules filled with whitish purulent matter, but without any surrounding injection, or inflammatory circle.—The *lungs* are often much diseased; but the alterations of them most frequently seen, occur only during the last days of life; and are referrible to the predominance of physical, over the vital, forces, as the disease approaches a fatal issue. But as congestion of the circulating fluids occurs in the more depending parts, the vital cohesion, particularly of the parenchymatous parts of the lungs, becomes diminished, giving rise to more or less marked *softening* of the engorged part. In less frequent instances, it is not only a simple congestion from stasis of the fluids that is found, but also indications of pneumonia in the first or second degree. The pneumonia is sometimes confined to two or three lobules; in which case it may have passed into a suppurative state before death: in other instances it occupies a whole lobe, but without any signs of suppuration. Oedema, or even emphysema, of parts of the lungs, is also occasionally remarked. The *bronchi* are generally red, or of a livid red, or violet colour. The tint generally deepens in the small bronchi, and in the direction of the air-cells. They also contain some mucus.—M. CHOMEL gives the following as the state of the lungs in 42 cases:—Congestion, with or without softening, in 18; hepatisation in the first degree, in 3; hepatisation in the second degree on one side, in 2; lobular pneumonia, in 3; emphysema, in 2; oedema, in 2; effusion into the pleura, in 2; and the normal state, in 10.

526. *h.* The state of the *blood* varies much in fatal cases of nervous, putrid, or typhus fever. Where the putrid, malignant, or septic characters have been most remarkable before death, the changes of the blood have been usually the greatest.—This fluid is commonly dark, black, diffuent; and but rarely in the state of fibrinous clots. In a few cases, the blood in the heart and large vessels assumes the form of black coagula, which are different from those observed in other acute diseases. This state is evidently owing to the absence, or great diminution, of fibrine. The presence of a gaseous fluid in the blood, especially in that of the veins, is also evident in some cases. I have observed this circumstance in death from other diseases, particularly if asphyxy was the mode in which the fatal event took place. (See art. BLOOD, § 110. *et seq.*)

527. *i.* The *heart* is often softened and somewhat discoloured. The *softening* of this organ varies from an almost unappreciable, to a most marked, degree. In some cases it is so great, that the fingers may be pushed through the parietes of the ventricles with ease. This diminution of cohesion is generally observed in cases where the changes in the blood, and softening of the liver and spleen,

have been the most remarkable. *Flaccidity*, or a state of softness different from that just mentioned, is still more frequent. The flaccidity may exist without very manifest loss of the cohesion of the structure; but it is generally attended by some degree of the latter, and the softening may be great, and yet the flaccidity not very apparent, although this is rare.—The *colour* of the internal membrane varies in different cases, and even in the opposite sides of the heart in the same case. In some, the membrane is red; in others dart, brown, or livid: it is often colourless, particularly when the heart is softened. It never presents inflammatory appearances, nor the changes immediately proceeding from the inflammatory state.—The researches of MM. TROUSSEAU, RIGOT (*Archives Génér. de Méd.* t. xii.—xiv.), and CHOMEL (*Clinique Méd.* p. 279.), show that the redness often found in the aorta, cavities of the heart, and large veins, in this class of fevers, is entirely owing to the tinging by, or to imbibition of, the colouring particles of the blood. Inflammation of the heart, or of its membranes, has not been observed in any case of these fevers.

528. *k.* The *external changes* observed after death most frequently commence a considerable time before this event. These consist chiefly of *petechiæ*, *vibices*, and *blotches*, varying as to size, situation, and depth of colour; and are to be ascribed to the extravasation of serum, coloured with red particles, or of blood itself, into the vascular layer of the skin. Gangrenous eschars, and sphacelus, are met with chiefly in parts pressed upon by the weight of the body, as the sacrum, shoulder blades, heels, and scalp of the occiput, or in those to which blisters, sinapisms, or other acrid substances have been applied. But these changes may occur in other situations, although rarely, and without these causes, as in the insides of the thighs; unusual pressure, or any other cause, either dissipating or exhausting the remaining vitality of the part, producing these effects. Phagedenic sores or ulcers, and enlargements of the absorbent glands, are also observed in rare instances. These sphacelating or spreading ulcers often commence in the form of pustules or vesicles, which break, leaving a foul sore which rapidly spreads. Besides these, the usual consequences of erysipelas are sometimes observed, or the remains of exanthematous and miliary eruptions. Even emphysema has appeared shortly before, and has remained after, death.

529. *B. Pathological conclusions.*—The *exposition* I have made of the organic lesions, more especially proceeding from typhoid fevers, suggests some important considerations, relative not only to the nature, but also to the treatment, of these diseases. Few of these changes become apparent before the seventh day from the invasion, when vascular action has passed into exhaustion, when organic nervous power and irritability are remarkably lowered, the circulating and secreted fluids are become morbid, and the powers of vital resistance in great measure overthrown. If inflammatory action should attack any part, either in this state, or even at an earlier stage, it will be very different, as to its phenomena, its progress, and its results, from inflammation occurring primarily, or in a system whose vital and physical constituents are not materially deranged. It is the remarkable affection of these

occurred, was mistaken for the cause of the amendment, instead of being viewed as the effect, and as one of the signs by which this change is often indicated.

533. The physicians who, in modern times, attributed an important part to putridity of the humours, recognised merely a portion of the mischief, and that often the most remote and contingent, and mistook, in great measure, both its origin and nature. They had recourse to camphor, bark, musk, and various preparations, both vegetable and mineral, possessing antiseptic properties; and, if they had employed them in appropriate periods and states of the disease, the benefit derived from them would have been much less equivocal. But, mistaking the origin of the phenomena usually called putrid, they frequently prescribed these medicines improperly; and whilst endeavouring by an early exhibition of them to prevent putridity, they actually often accelerated or favoured its occurrence.

534. A nearly similar mode of treatment was advised by BROWN, and his once numerous followers on the Continent; but it was based upon a different doctrine—upon the predominance of the asthenic diathesis and its consequences. Although wine, opium, tonics, and stimulants, were recommended by them, in various forms and combinations, with advantage, in certain states of typhoid fevers, particularly in the latter stages; yet the evils resulting from an early recourse to them were also sufficiently evident, and at last became manifest even to the disciples of this school. That this practice, and the modifications introduced by its partisans, did not prove so injurious in the treatment of fever, especially on the Continent, as may be supposed, is accounted for by the circumstance, that depressed vital power, with septic changes in the fluids in the last stages, characterised the much larger proportion of fevers prevalent for several years after its promulgation. But the appearance of exanthematic typhus in the north of Italy, at the close of the last century, opened the eyes of RAZORI to the impropriety of having recourse to stimulants in its treatment, and laid the foundation for the doctrine and practice of *contra-stimulus*. The general character of the petechial fevers prevalent about the commencement of the present century in Italy and Germany, was such as I have delineated in the section on typhus (§ 497.), with more or less of inflammatory or irritative action in the stage of excitement; the exanthematous eruption in this stage being frequently mistaken for petechiæ, and the appearance of these, and of other adynamic symptoms, being favoured by the vascular reaction which preceded them.

535. The administration of *tartarised antimony*, in large doses, was the principal treatment employed by RAZORI. When the patient was young and robust, and the disease had not reached the acme of excitement, he directed a moderate bloodletting at the outset, and, immediately afterwards, four, six, eight, ten, or twelve grains of tartar emetic, or even more, in solution. He prescribed this medicine in smaller doses subsequently, or substituted for it the *kermes mineral*, conjoined with nitre, and in doses of one grain, or of a grain and a half, every half hour, or hour, or every two hours, according to the degree of vascular excitement. He often gave the tartar

emetic and kermes alternately. RAZORI also employed purgatives, particularly when the antimony did not act sufficiently upon the bowels; preferring neutral salts, manna, and tamarinds, in large doses, and administering them, in other cases, in enemata. He enforced a cooling regimen and severe diet, and allowed only refrigerant beverages. The success of this treatment is stated to have been great; and its propriety, as well as success, may be admitted, when employed in an epidemic characterised by high vascular excitement at its commencement, and when adopted sufficiently early after reaction has taken place, and in previously healthy persons. But in other states of typhoid fever, and in the latter stages especially, the large doses of antimony here advised appear not, *a priori*, to be suitable means. It should, however, be admitted, that the exhibition of tartarised antimony in the advanced stages of this fever has never been satisfactorily tried, either in this country or in France and Germany. That it may be found not so inappropriate as generally considered, is an inference which the trials made of it, very recently, by Dr. GRAVES, of Dublin, fully warrant.

536. The pathological tenets lately prevalent in France have, as M. CHOMEL states, prevented the treatment of RAZORI from being adopted, or even tried, in that country. The doctrine of BROUSSAIS was opposed to this and every other means that seemed to its supporters likely to aggravate the inflammatory action of the digestive mucous surface, which they suppose to be the cause of all fevers. If we examine the practical tenets of this school, we shall find more than one postulatium assumed as fully established, although admitting not only of doubt, but even of disproof. That fever does not depend upon this lesion, although predominant morbid action in the digestive canal may appear in many cases, and in some fevers more frequently than in others, has been already shown. And, granting that this morbid action is attended by vascular injection of the mucous membrane, it still remains to be proved, that it is the same kind of affection as inflammation. That it is not the same as primary and sthenic inflammation, its phenomena and results, as well as the *juvantia* and *lædenta*, sufficiently prove. Even granting the doctrine of BROUSSAIS in its fullest range, it still remains to be demonstrated, that the treatment advised is that which is the most beneficial, or the most appropriate, in the numerous and varying morbid conditions which fevers assume; and it, moreover, should be shown, that the means which the espousers of this doctrine reprobate, are one what more prejudicial than those which they laud. In a class of diseases so varying, and even opposite, as to their pathological states, as fevers are, not only in their different forms, but also in the same case at different stages, the success of various remedies cannot be predicated from doctrinal tenets. However ingenious the theory, and close the reasoning, by which we are led to practical inferences, careful experiment and repeated observation are necessary to test the character of any method of cure; and even were we to adopt the views of BROUSSAIS, to these tests we ought to resort before we should decide between the efficacy of gum-water and leeches on the one hand, and that of antimony and purgatives on

—This treatment will generally shorten the chills, &c. characterising this period, and favour a relaxation of the surface, or the occurrence of moderate reaction.

541. c. In the *stage of excitement*, the treatment must altogether depend upon the degree in which reaction is developed, and the manner in which the brain, the lungs, or the digestive canal, appears to suffer. If the fever does not present, early in this state, the characters of low nervous fever, to their full extent, or those of an adynamic, or of a putrid or septic kind, then a small or moderate *bloodletting* may be prescribed; but the effects at the time of the operation should be carefully observed. If the patient be young, or robust, previously healthy and well fed, then a more copious depletion may be practised, if he be seen early. Even in the lower states of this fever, if any of the viscera just named be prominently affected, a *local depletion*, either by leeches or by cupping, may be employed. But if the period of excitement be far advanced; if the fever be simple or mild; if it have passed the tenth day; and if it be the true or exanthematic typhus, untended by inflammatory associations; bloodletting will seldom be of service, and it may interrupt the regular and favourable course of the disease, particularly the latter form of it. In a large number of cases, in which M. Louis states bloodletting to have been tried, and in which it appears to have been indicated, the advantage procured by it seems to have been slight; but sufficient to increase, to a small amount, the proportion of recoveries, and to diminish the duration of the disease.—*Emetics* have been advised also in this stage; and, in cases where the chills return on successive days, or frequently alternate with flushes, I believe that they will be found of service. HILDENBRAND directs them in the first, second, or third day, or even later; having premised a bloodletting in the cases indicating it; and prefers a large dose of ipecacuanha, with a grain of tartar emetic.—Next to emetics, *purgatives* are of advantage. At an early period, or before the eighth or ninth day, a full dose of calomel, either alone or with rhubarb, may be given; or jalap, with cream of tartar; and their action promoted by moderate doses of the neutral salts, or by manna, tamarinds, &c., according to circumstances. These clear away morbid secretions, and mucous sordes, from the digestive surface; which, if allowed to remain, would favour the occurrence of the morbid changes in the intestines. If, however, the bowels have been much relaxed, and still continue so, it will be preferable to give an occasional dose of hydrargyrum cum creta, rhubarb, and ipecacuanha, which will promote a healthy state of the mucous surface, and facilitate the evacuation of morbid secretions. If the bowels be only gently open, the circumstance is favourable; but an inordinate action of them must be moderated by the above medicine, or by others hereafter to be mentioned, lest intestinal ulceration and perforation be the ultimate result. At the same time, care should be taken not to produce a sudden change or constipation, otherwise the cerebral or nervous symptoms will generally be much aggravated, and a tendency to effusion on the brain be produced.—*Diaphoretics*, suitable to the state of the symptoms, either variously combined, or associated with diuretics, may be given

from time to time. Of these, the more refrigerant, with small doses of camphor, will be most serviceable; and either some one of those in the Appendix (F. 431. 436. 440. 818. 865.), or the following, may be prescribed:—

No. 225. R. Camphoræ rasæ gr. ss.—℥; Potassæ Nitratæ gr. iij.; Pulv. Acaciæ gr. ij.; Mucilag. Acaciæ q. s. M. Fiat Pilulæ ij. quartis horis sumendæ.

No. 226. R. Mist. Camphoræ ʒj.; Liq. Ammoniac Acatatis ʒij.; Ammoniac Muriatis, gr. iv.; Syrup. Lemnis ʒj. M. Fiat Haustus, quartâque horâ capendus; vel interdum, secundis horis, pilulæ et haustus, alternis vicibus, sumantur.

542. d. In the *nervous stage*, the debility is more real; irritability is more exhausted, and the sensorium more severely and uniformly affected. The functions of the skin, and frequently those of the bowels, are also more disturbed than before. The *indications* are to support or stimulate the system, according to the forms the disease assumes.—*Blister*s may be employed in this stage—seldom before. They favourably impress the nervous system, check the tendency to diarrhoea and affection of the intestinal mucous surface, and render the skin more perspirable. They are most serviceable at the commencement of this stage; and are best applied on the nape of the neck, behind both ears, or on the calves of the leg.—*Camphor* is now one of the best remedies that can be exhibited. Whilst it promotes nervous power, it relaxes the skin, and does not increase inflammatory action, but rather tends to allay it, particularly the nervous and cachectic forms of it, which alone can exist in this disease. It should be given in larger doses in this stage, more especially of the malignant or putrid form. From twelve to twenty grains may be exhibited in the twenty-four hours. HILDENBRAND advises, in the latter part of this stage, medium doses of camphor; or one grain every two hours, with an infusion of *arnica* and *angelica root*. He considers that these lessen the stupor, giddiness, and delirium; act favourably on the skin, and prevent the tendency to diarrhoea.—*Emetics* are sometimes beneficial in this stage, when they have been neglected in the previous one, or contra-indicated.—*Purgatives* are of service only when the bowels require assistance. They should be given with the intention of evacuating morbid matters, of preventing the injurious impression made by such matters upon the intestinal mucous surface, and of promoting a healthy action of the abdominal emunctories. Hydrargyrum cum creta, and rhubarb, and the infusion of the latter with the milder saline substances, in a state of effervescence, are the most appropriate. These preserve the tone of the digestive mucous surface, whilst they enable it to throw off fecal collections. Their action may be occasionally promoted by emollient and gently laxative enemata. I doubt much the propriety of exhibiting *calomel*, or any of the drastic purgatives, in this stage; and I believe that the more active neutral salts exhaust the strength, and produce watery stools, in this period, particularly if they be exhibited in any quantity. It is in the common, or synchoid, form of fever, or at the commencement of this, that they may be employed. In the latter stages of low fevers, calomel and cathartics are apt to increase the intestinal symptoms, or to determine an irritative action of the bowels, liable to terminate in the lesions already noticed.

543. e. When the disease has reached its acme,

and camphor, ammonia, ipecacuanha, or other expectorants, with hyoscyamus, or extract of poppy, are the principal means we possess. When, in this complication, the skin is cool and pale, the pulse very weak and small, and the features collapsed, the warm expectorants, as polygala, ammoniacum, ammonia, camphor, the stimulating tonics, and wine, should be given, according to the peculiarities of the case.

546. *β. Predominant affection of the intestinal mucous surface* should be treated by means similar to those advised in this complication of synochus; and the more especially, as the latter fever, when thus characterised, either passes into, or is very nearly allied to, the typhoid form. In the early stages of this complication, a combination of small doses of hydrargyrum cum creta, rhubarb, and Dover's powder, with compound cretaceous powder, given every three or four hours, is generally of service. If the constitutional symptoms will permit, and if this affection appear at an early period of the fever, a local depletion should be premised, and a blister or sinapism be afterwards placed upon the abdomen. The terebinthinated epithem, applied sufficiently hot, and covered so as to prevent evaporation, if properly managed, is the most efficacious means—more particularly if the abdomen be tense, tender, or tympanitic. In this latter state, an injection with assafoetida, or with the extract of rue, or with from two drachms to half an ounce of spirits of turpentine in addition, will give great relief.

547. In a far advanced stage, *diarrhœa*, especially if attended by tension, pain, or flatulent distension of the abdomen, requires great attention. If the medicines just recommended prove not of service, the *chlorurets*, particularly the chloruret of lime, may be given, with camphor, and extract of poppies, &c. Mucilaginous injections, containing syrup of poppies, or laudanum, or compound tincture of camphor, may also be administered, and a rubefacient epithem placed over the abdomen.—If *hæmorrhage* from the bowels occur, it may be ascribed chiefly to exudation from the softened mucous surface, as shown by the post mortem appearances; and *superacetate of lead* with opium, or acetate of morphine, or extract of poppy, should be exhibited, either in the form of pill, or with the pyroligneous acetic acid, in strong camphor julap. The lead has been recommended, in these cases, by Drs. BARDESLEY, GRAVES, and STOKES. I have resorted to it in these several combinations, and have given it in two or three instances with kreosote.—I have likewise employed, by the mouth, and in enemata, the spirits of turpentine, which generally proves the most active remedy of any in such circumstances. In some hopeless cases, it has succeeded contrary to expectations. In one, however, that recently occurred to me, although it arrested the hæmorrhage for a time, there was a return which carried off the patient. If the disease be far advanced, or the powers of life much reduced, the turpentine should be given in small or moderate doses, and its effects carefully watched. I have also prescribed it in conjunction with kreosote, the acetate of lead and aromatics, in similar circumstances.

548. *γ. Prominent affection of the brain* may arise in the course of typhoid fever, either from congestion within the head, or from the depressed

state of nervous power, unconnected with inflammatory action, or even with vascular determination. This circumstance, long believed by pathologists, has been fully confirmed by M. LECHE, who found, that the presence or absence of delirium has little or no connection with perceptible organic lesion of the brain. If, however, there be increased heat or severe pain of the head, spastic contractions of some muscles, flushed face, injected eyes, or other indications of active disorder of the cerebral circulation, particularly in the stage of reaction, the hair should be removed, and local depletion resorted to. The head ought to be kept cool, by cold sponging, or lotions. If delirium be attended by these symptoms, the same means are required; and, if it be, at the same time, low, insensible, or muttering, a blister should be applied to the neck and nape, or behind the ears, or to the calves of the legs, or a sinapism may be substituted in the latter situation. Whenever the affection of the head is connected with increased determination to it, especially in an early stage, stimulating antispasmodics, as ammonia, musk, or camphor in large doses, cannot be of service, and may be injurious. The last of these, however, may be used in small doses with nitre, and it may be increased according to the degree of stupor, and coolness of the scalp. If the delirium depend upon exhausted nervous power—if it be attended by stupor; by a weak, soft and very quick, or somewhat slow pulse; by a moist skin, or copious perspiration; or by extreme prostration, particularly after the eighth or tenth day, or in the nervous stage; camphor in doses of from one to three or four grains every two, three, or four hours; or the preparations of *valerian*, or of *serpentaria*, or of *arnica*, or *ammonia*, or of *ether*, or *wine* or *opium*, may be severally employed as circumstances will suggest. In other respects, the treatment of this state, and of sopor and coma, its frequent attendants and sequents, should be directed, as explained in the articles COMA (§ 16. 19.), and DELIRIUM (§ 16, 17.).—*Retention of urine* is very apt to occur in this state; therefore, in it especially, but also in all others, attention ought to be paid to the circumstance. If an undue accumulation of water in the bladder be detected upon examining the hypogastrium, it should be immediately drawn off.

549. *δ. In the most severe form of nervous fever* (§ 476.), bloodletting is seldom of service, unless at the commencement of reaction, or from the vicinity of the most affected organ. When the skin is very hot, *tepid sponging*, *disphorics*, *external derivatives*, and *emollient diluents*, with *nitre*, or small doses of the *murriate of ammonia*, are the most appropriate. The infusion of *valerian* may be given as the disease passes into the nervous stage, either with the *ammoniated tincture* or with camphor, and *murriatic ether*, or other stimulants.—HILDENBRAND advises the *arnica montana* with camphor, in this state.—If exhaustion increase, and coma come on, these medicines, or others of a similar kind, may be prescribed in larger doses, or at shorter intervals; and a blister applied to the vertex, or occiput, or to the nape; or a large sinapism to the epigastrium, or inside of the legs. LALLEMAND and MACKINTOSH have adduced instances of benefit, in the comatose state, from pouring boiling water on the lower

555. *a.* The occurrence of *perforation of the intestines*, and consequent *peritonitis*, should not be overlooked in the enteric complication, or other severe forms of low nervous fever. Peritonitis seldom arises except from this cause, for large patches of the mucous surface, with PEYER'S glands, may be destroyed by ulceration; and yet the peritoneum will be unchanged. When, however, diarrhoea has been suddenly arrested early in the disease, by an injudicious use of astringents, general peritonitis and effusion may result, without perforation, and even without ulceration. But this is only one of several bad consequences which may proceed from injudicious interference. If, in an advanced stage of fever, and after thirst, diarrhoea, tympanitis, and great prostration of strength, the patient suddenly complain of pain in some part of the abdomen, extending over it, with tenderness, increased distension, and rapid sinking of the powers of life, peritonitis has occurred. In this case, large doses of opium, to palliate the patient's sufferings, are the only means that can be used with any benefit. — Dr. STOKES, who has very ably elucidated the subject of peritonitis from this cause, and its treatment, directs one grain of opium to be given every hour, or two hours, until a decided effect is produced by it; and afterwards at longer intervals. (*Dublin Hosp. Rep.* vol. v.; and *Dublin Jour. of Med.* vol. i. p. 125.) When effusion of the intestinal contents into the peritoneal cavity occurs, the result must be fatal. But when adhesion of the peritoneum to the opposite surface takes place previously to the perforation, or when the perforation is speedily followed by a limited inflammation and effusion of lymph, recovery is possible. The formation of coagulable lymph can hardly, however, be expected in peritonitis occurring in the course of fever; as the states of vital action, and of the circulating fluids, are generally incapable of producing it.

556. *b.* *Treatment of putro-adynamic fever* (§ 484.).—The phenomena which especially characterise this variety, may appear either at an early stage of fever, or at an advanced period,—they may be the concomitants, or early consequences, of depressed vital energy, and imperfect powers of reaction; or the results of vascular reaction being so great, relatively to the state of vital influence, as to exhaust both the irritability of contractile parts, and the tone of the extreme vessels. In either case, alterations of the circulating fluids, and deficient vital cohesion of the soft solids, speedily follow, and coexist with these changes. In conformity with this view, with the pathological facts stated above (§ 529.), with a recognition of the characters of epidemics which have been observed in modern times in different countries, and with the results of personal observation, it may be safely inferred, that the treatment of this fever should mainly depend upon the state of vital action early in the stage of excitement, and the period of the disease in which the putro-adynamic signs appear; and that, in a practical point of view, it will be, therefore, advantageous to divide this variety of typhoid fever into—1st. The *consecutive putro-adynamic*, or that form which is contingent on more or less manifest reaction; and, 2d. The *primary putro-adynamic*, or that which is attended by imperfect, or no, reaction, and in which the characteristic pheno-

mena appear early in the disease. It should, however, be recollected, that both these forms may occur in the same epidemic, or that either may predominate; and, moreover, that the first or contingent state of putro-adynamia is sometimes met with in all epidemics, whether the fever be common synchoid, typhoid, or exanthematous, owing to the causes stated above, and with a frequency relative to the prevalence of these causes (§ 468.).

557. *a.* The *stages of premonition* and of *invasion* of this variety, are scarcely different in their characters from those announcing nervous or typhus fever. The same means as have been advised above (§ 540.) may, therefore, be resorted to, with the intention of preventing the further progress of disease, or of rendering it more mild.—When the symptoms of invasion are either indistinct or protracted, the consequent fever is often rendered much less dangerous than it otherwise might have been, by the adoption of the measures already detailed, and more particularly by exhibiting an energetic *emetic*, and by promoting its full operation by warm or tepid mucilaginous diluents. Tepid sea water, or a weak solution of common salt in a tepid state, has been employed with advantage, for the purpose either of promoting the action of the emetic, or of producing full vomiting, when there has been nausea or sickness.

558. *β.* In the *consecutive putro-adynamic*, or when the *stage of excitement* is more or less developed,—when the pulse is frequent, full, or sharp; the skin hot, and thirst considerable, or if an internal heat be felt; vascular depletion may be practised, but with due reference to the circumstances of the patient, and to the period which has elapsed from the time of invasion. So long as the characters of putro-adynamia have not appeared, these symptoms fully warrant a cautious recourse to depletion; and in young robust persons, even a repetition of it.—If rigors and shiverings are followed by inordinate or tumultuous reaction, the necessity of larger depletions is obvious. But, even in this case, they should not be carried too far, or to the extent of producing syncope; otherwise, in attempting to avoid the exhaustion consequent upon excessive action, a quantity of blood may be withdrawn, too great for the diminished power of tonic contraction possessed by the blood-vessels,—the vessels being incapable, owing to the loss of their tone, to accommodate themselves to, or contract sufficiently upon, their contents, when the reduction of these contents is great,—and thus collapse of vascular action, and of vital power, may follow.

559. *γ.* In the *primary putro-adynamic*, or in cases attended by indistinct signs of invasion, and by imperfect reaction, we can hardly venture upon depletion, unless indications of congestion or prominent affection of an important organ present themselves. In this instance, local depletions, or dry cupping, may be tried. If petechiae appear early in these cases, or if the pulse be very compressible, very small, or broad and open; if the skin be cool, damp, or unnatural, yet not hot; if the tongue be flabby, or covered by a dirty mucous, although the fever is evidently not far advanced, or is very recently passed the stage of invasion; then bleeding should not be attempted. In this case, very different means must be em-

tion of cinchona with the compound tincture, nitrate of potash, and subcarbonate of soda, I can also speak from experience. When the prostration of strength is extreme, a pill containing two or three grains of camphor should be taken with each dose of either of these, at short intervals.

564. Other tonics, and different combinations of them from these now mentioned, will frequently be productive of great benefit, when morbid excretions have been evacuated. However specious the arguments adduced by some writers against the employment of *acids* in the putro-adyynamic states of fever, it cannot be denied that good effects have been produced by them, especially when exhibited with powerful tonics. The infusion or decoction of cinchona, with muriatic acid, or with nitro-muriatic acids, and chloric ether (formerly CLUTTON's febrifuge); the sulphate of quinine with sulphuric acid, and HORMANN's anodyne; and pyroligneous acid in large doses, with camphor, the solution of the acetate of ammonia, and tonic or aromatic infusions, or the infusion of serpentaria or of arnica, are the most energetic, and may severally be tried, according to the peculiarities of the case. A solution of camphor in acetic acid was a favourite medicine with many writers on putro-adyynamic fever, and was employed by them both internally and externally.

565. Dr. STEVENS's saline treatment is most appropriate in this form of fever. He directs twenty grains of the muriate of soda, thirty grains of the subcarbonate of soda, and eight of the chlorate of potash, to be given every two or three hours—or more or less frequently, according to the urgency of the case—dissolved in water, in the advanced stages. He believes that, when these salts are prescribed before the stomach has ceased to perform its functions, they will not irritate the alimentary canal, but will be absorbed into the circulation, and correct its morbid state. One or two table-spoonfuls of common salt may also be administered occasionally in a tepid gruel enema. The strength should, at the same time, be supported by strong beef tea, or the regimen about to be recommended.

566. ζ. If putro-adyynamic fever be attended by *predominant affection* of any organ, local depletions, followed by external derivatives, will be necessary, particularly in an early stage of the fever.—At a later period, external derivation, and the other means advised for the complications of nervous fever, according to their seat, should be employed. In this variety, however, a more liberal use of tonics, conjoined with the antiseptics just mentioned, is generally required.—When this or any other form of typhoid fever is complicated with *asthenic inflammation of the fauces or pharynx*, or both, the means already recommended are quite appropriate. In these cases, deglutition is very difficult, and sometimes impossible. Recourse to external derivatives, and to injections, is then urgently required. The action of the bowels should also be solicited by purgative enemata, unless diarrhoea exist; and the medicines that are indicated should be administered in clysters, and in sufficiently large doses. As the patient is generally unable to gargle his throat, advantage will sometimes accrue from syringing it with any of the tonic mixtures above prescribed, or with a solution of the chloruret of lime or of kreosote; and if a part, or the whole, or either

of these, should be swallowed, the more benefit will be derived.

567. η. If this variety become complicated with *diarrhoea*, disorganisation of the digestive mucous follicles and surface will rapidly take place, if the treatment be not prompt and judicious. The means already advised (§ 546. 447.) for this complication must be adopted in this case. If the diarrhoea occurs at an early period, it will generally be moderated by tonic infusions, with the nitrate of potash, or with the muriate of ammonia, and the compound tincture of camphor. A combination of ipecacuanha, nitre, camphor, and opium, or extract of poppy, will also often diminish or remove it. If *hæmorrhage* supervene from the bowels, these medicines will sometimes be sufficient to remove it. In more urgent cases, the energetic remedies previously directed (§ 547.), or the pyroligneous acetic acid, with camphor and kreosote, or turpentine, &c., should be prescribed by the mouth, and in enemata. When diarrhoea or hæmorrhage characterises putro-adyynamic fever, the alkaline subcarbonates will frequently aggravate or perpetuate it, and render convalescence protracted. In other respects, the treatment directed for the complications of nervous fever, and for its last stages, is also suitable to this; these stages requiring either the measures just described, or several of those about to be noticed, with a more or less direct reference to the putro-adyynamic state, or various combinations of the substances already enumerated (§ 548—555.).

568. c. *Treatment of Exanthematous Typhus* (§ 497.).—The *premonitory* and *invading* periods of this fever should be treated as recommended above (§ 540.), with the view of arresting or rendering more mild the procession of morbid phenomena.—a. In the *stage of reaction*, the indications are—(a) to moderate excessive excitement; (b) to guard important organs from the effects of prominent action.—If full vomiting has not occurred previously, it should be excited by an emetic, at the commencement of this stage, or on the first, second, or third, day of it. If, however, inflammatory signs have become evident, particularly if the lungs are affected, a moderate *bloodletting* should precede the emetic. The eruption, which generally appears in this period, is usually followed by slight alleviation of the symptoms, and should therefore be promoted by mild, tepid diluents, which may be made either diaphoretic, mucilaginous, or acidulous, according to circumstances. As to *bloodletting* in this disease, it is pernicious in many, if not in most cases; and not merely in the nervous, but even in this stage. In the mild and regular typhus, it is superfluous: but when a highly inflammatory character marks this period, or when local action becomes very prominent or excessive, it must not be omitted; otherwise the local affection may run into disorganisation, and the nervous stage will be rendered more protracted or dangerous. The amount, repetition, and mode of depletion, will depend upon the peculiarities of the case.—When the bowels are open in this stage, *purgatives*, unless of the mildest kind, are unnecessary. Severe purging is prejudicial, as it derives from the skin, interrupts the regular course of the disease, and risks the production of the enteric complication. Tonics and stimulants are also injurious.

574. *ζ.* The nervous inflammation of the brain is indicated by sopor and profound typhomania, and should be combated by blisters on the head; by camphor, by arnica, and the means directed for this affection in nervous fever (§ 548.). If tightness of the chest and dyspnoea occur in the nervous stage, congestion of the weakened vessels of the lungs may be inferred. In this state, a small bleeding, to the amount of four or six ounces, may be directed in some cases, and followed in all by blisters on the chest, and antimonials conjoined with camphor.

575. *ν.* If the *putro-adyynamic* character supervenes and predominates as the nervous stage proceeds, the debility, equally with the morbid state of the blood, requires attention. The preparations of cinchona, either with mineral acid, or with alterative neutral salts, large doses of camphor, wine, opium, and the other means directed for the various phases and complications of this condition, will be required according to the peculiarities of individual cases. If *diarrhœa* or *dysentery* comes on in this state, opium in large doses, but at distant intervals; warm dilute wine, with spices and other aromatics; mucilaginous and farinaceous liquids, or gruel, with common salt, taken in small quantities but often, and administered in enemata, with syrup or extract of poppies; and the other remedies noticed above (§ 553.); should be prescribed. — If *singultus* or *meteorismus* occur, they should be treated conformably with the principles already explained (§ 554.). — Swellings of the parotids are unpleasant accidents, even when critical. They should be checked at first by keeping the bowels moderately open, and cold applications to them. If this end be not accomplished, then suppuration should be promoted by stimulating poultices; and the abscess should be early opened, in order to prevent contamination of the surrounding cellular parts. If gangrenous sores appear in any part, the means directed above (§ 166.), more particularly the chlorides, kreosote, powdered bark, turpentine, &c., either severally, or variously combined, or in the form of wash, epithem, or poultice, ought to be promptly and assiduously employed.

576. *iii.* Of certain Medicines, &c. in Typhoid Fevers. — *a.* Antimonials, especially JAMES'S powder and tartar emetic, are frequently of service in the early stages of fever: the latter for its emetic operation, and its febrifuge or contra-stimulant action during excitement; and the former for this last effect, in connection with its diaphoretic influence. The remarks already offered respecting these medicines (§ 162.) are applicable to the use of them in the fevers under consideration. It is chiefly in the early periods, in the more inflammatory states, in the pulmonary complications, and either in aid of, or as substitutes for, blood-letting, that they should be employed, more particularly tartarised antimony. However, the results of RAZORI'S practice, and the recent trials made of this medicine by Dr. GRAVES, in the advanced stage of typhus, indicate the propriety of having recourse to it, at a later period, in much more liberal doses than have been hitherto considered safe. This able physician, reasoning from the good effects of the medicine in delirium tremens, was induced to resort to it in a case presenting a quick, failing pulse; a black, dry, tremulous tongue; tympanitis; low, muttering deli-

rium; startings of the tendons, and nervous agitation. He prescribed four grains of tartar emetic, in eight ounces of camphor julap, with a drachm of tincture of opium — a table-spoonful to be taken every second hour. The patient vomited after the second dose; and, after the fourth, he fell into a calm sleep, and soon recovered. Besides the good effect of this medicine, that of vomiting at this stage of fever, as recommended by many of the older writers, is shown by this case. Dr. GRAVES refers to other instances (*Lond. Med. and Surg. Journ.* vol. vii. p. 541.), in which tartar emetic and opium produced decided benefit, in most unfavourable states of the advanced periods of low nervous fever, and of exanthematic typhus. The combination of tartarised antimony with nitre is most appropriate in the stage of excitement; but, in the nervous stage, opium seems indispensable to the good effects of the antimony.

577. *b.* Of other antiphlogistic and contra-stimulant means, it is unnecessary to add any thing to what has been already advanced. The contradictory opinions entertained as to the propriety, or amount, of depletion are readily explained, when the various forms of typhoid fever, and circumstances of the case, are taken into consideration, in connection with the intentions with which bloodletting on the one hand, and restoratives on the other, are resorted to; and with the fact that both are very frequently required, not only consecutively but even simultaneously. This circumstance was well known to very many of the numerous writers on these fevers during the three last centuries, both in this and in foreign countries. They well knew and strenuously inculcated the fact, even as late as the days of CLARK, that, in order to prevent the accession of the putro-adyynamic state, it is necessary to bleed, and to use other antiphlogistic remedies, with decision, early in various fevers and epidemics. And next to bleeding, nitre and the *muriate of ammonia* were held in estimation, for their effects in lowering morbid reaction at the commencement of typhoid fevers, and in preventing putridity in advanced stages. Thus, whilst nitre was conjoined with antimonials, ipecacuanha, small doses of camphor, or with the spirits of nitric ether, to fulfil the former intention, and to promote perspiration and the action of the kidneys, it was given with tonics and stimulants, to produce the latter indication. The writings of DELIUS, HILLARY, HANEL, WOOD, RAZORI, and many others, show us how very little we have hitherto improved upon their practice in these fevers. The same remark applies to the use of the *muriate of ammonia*, whose operation as a refrigerant, antiseptic, and tonic ranks it as one of the best and most generally applicable of the many remedies employed in fever.

578. *c.* As to the use of *alvine evacuation*, we have arrived at similar conclusions to those very generally acted upon during the seventeenth and eighteenth centuries, but partially lost sight of towards the close of the latter. — The good effects of emetics at the commencement of typhoid fevers were almost universally admitted, until BOERHAAVE banished them from his code of therapeutics. — That circumstances sometimes occur, which either render them unnecessary, or even forbid them altogether, has been allowed; but

581. *Arnica* has been very much employed in Germany in low fevers, and in the nervous stage of typhus, yet it has not received a satisfactory trial in England nor in France. STOLL, FISCHER, COLLIN, FERRO, MERCIER, FRANK, RICHTER, HECKER, HILDENBRAND, and other high authorities recommend it, generally as directed above (§ 569.). QUENTIN prescribes an infusion of it with valerian. The flowers and the root are most commonly employed, and usually in the form of a weak infusion (F. 222, 223.).

582. In the low nervous form of typhoid fever, as well as in the nervous stage of exanthematic typhus, or in that stage and state of the disease for which the German physicians prescribe *arnica*, *valerian* may be employed with advantage. MATTHEI, FRIZE, REIL, THOMANN, and others recommend it. I have given an infusion of it in several cases, and made it the vehicle of other medicines, particularly the chlorate of potash, camphor, the alkaline subcarbonates, *serpentaria* (F. 269, 270.), &c. It is indicated in such states of fever as require a gentle tonic and stimulant of the nervous influence, especially when the nervous symptoms are prominent, although the head be cool, and the pulse weak. In these circumstances it may be conjoined with camphor, tonics, &c.

583. *Serpentaria* root was praised by FRIZE, STOLL, REIL, MARCUS, and others, in the advanced stage of low fevers, and in the circumstances just mentioned. It is still used, when the skin is cool or the pulse is weak, and when warm stimulating tonics are required. It is most serviceable in the form of infusion, with aromatics and tonics (F. 262. 416. 826.). *Angelica* root was recommended by REIL; *imperatoria* root, by HOFFMANN; and the root of *calamus aromaticus* by HILDENBRAND. They are very rarely employed in this country, although they are of service, particularly in the form of infusion, as vehicles for other medicines, and on account of their warm, diaphoretic, and stimulant effects. They may be employed variously combined with each other, or with camphor, tonics, &c.; and are indicated in the same circumstances as require the use of *arnica*, viz. in the low nervous and putro-adynamic states. Their infusions are good vehicles for tonics, the chlorates, or alterative salts. I have sometimes prescribed them with chloric acid and chloric ether, or with the chlorides of soda and potash.

584. *s. Cinchona* and other tonics have been praised by HUXHAM, LIND, LANORISH, GRANT, WESTPHAL, SIMS, VALLISNERI, CASSON, FORDYCE, and most of the writers on fever during the last century, and by many contemporary authors; whilst others have attributed more or less mischief to their use. When the various forms of typhoid fevers, their complications, and the very different pathological states in the successive stages of their course, are considered, this contrariety of opinion is easily explained. When the nervous stage has appeared, and when the putro-adynamic state is pronounced, whether early in the disease, as in the putrid or septic variety, or in the advanced stages of the nervous and exanthematic, the preparations of *cinchona*, and the *sulphate of quinine*, are the best tonics that can be selected, both for the permanence of their action, and for their influence in arresting the disposition to colliquation that pervades the fluids and soft solids

of the frame. In the early states of the disease, and where the propriety of having recourse to tonics is a matter of doubt, the infusion of bark, with the solution of the acetate of ammonia, and spirits of nitric ether, or the decoction of *cinchona*, with nitre and muriate of ammonia (F. 437, 438.), will generally prove serviceable.

585. *f.* The propriety of having recourse to acids in the states of low fever just alluded to has recently been disputed; and if the effects produced by them on the blood be considered, as shown by the experiments of FRIEND, ELLER, GIANELLA, HALLER, &c., and as stated in the article BLOOD (§ 135, 136.), rational doubts of their salutary influence may be entertained: yet the experience of most writers is in favour of them, particularly in fevers of a low character. SPANGENBERG, HUXHAM, LANORISH, WOOD, MURBINNA, ROWLEY, BOYER, RADEMACHER, SCHLEGEL, HORT, FORDYCE, BANG, MILLAR, FRANK, HUFELAND, &c. recommend the mineral acids, especially the *muriatic*, in the circumstances mentioned above. From a careful observation of their effects in many cases, I believe that they will prove beneficial in some cases, and injurious in others, according to the period and state of fever, and the mode of prescribing them. If they are given before the blood has become materially altered, and the vital energy much exhausted, but after requisite vascular or alvine evacuations have been carried sufficiently far—whilst the skin is still warmer than natural, and whilst the pulse is broad, open, and compressible, the mineral acids, with tonic infusions, will generally be serviceable. In this state, the infusion or decoction of *cinchona* may be given with muriatic acid and chloric ether; or the sulphate of quinine, with infusion of roses and sulphuric acid, or also with sulphuric ether. When the prostration is considerable, this latter may be the more energetic medicine. In more doubtful cases, particularly when the heat of surface is great, the infusion of *cinchona* or of valerian may be given with the nitrate of potash, or with the nitrate of soda, a few drops of nitric acid, and the spirits of nitric ether; and when the skin is cooler, either of these infusions, or some one of the others already mentioned, may be prescribed with equal parts of the nitro-muriatic acid and the tincture of *serpentaria*.

586. In the treatment of typhoid fevers it should never be forgotten that the state of the circulating fluids depends chiefly, if not entirely, upon that of the organic nervous influence, and that agents which apparently deteriorate the blood may yet be of use by administering to this influence. The carbonic acid gas was supposed by JANSSEN, FORTIER, and PERCIVAL, to act as an energetic tonic, when taken into the digestive canal; and they, therefore, directed the use of those fluids which contain it most abundantly; and even advised it to be thrown up the rectum. A similar practice was lately recommended by Dr. CLANNY, with the view of supplying the blood with this substance. But M. CHOMEL has shown the inefficacy of the practice (§ 538.). The acids which have appeared to me most serviceable in the early period of the adynamic, nervous, or putro-adynamic forms, are the muriatic, and the pyroligneous acetic, particularly when given in the decoction of bark (F. 388.), or in either of the warm stimulant infusions mentioned above.

healthy discharge of the functions, as the muriate of soda is, would have been more generally manifest in these diseases, if other substances, acting somewhat similarly upon the blood and on the system, had not been commonly employed in the treatment of them. I have been led, by the antiseptic properties of certain medicines, to have recourse, in the latter stages of low fevers, to the most energetic of them, particularly the nitrate of potash, the chlorate of potash, the muriate of ammonia, camphor, and the terebinthines, cinchona, &c. in various combinations, either with each other, or with different stimulants and tonics, with the view of exciting the nervous influence, of supporting the powers of life, and of counteracting the changes, frequently terminating in a dissolution of the vital crasis and cohesion of the fluids and soft solids. But in fevers, which are characterised by excessive action at the commencement of excitement, and by extreme exhaustion, loss of irritability, and depravation of the fluids, in the latter stages, a too early recourse to some of these medicines may increase the morbid action, and aggravate local determinations; while a too cautious reserve of them, either as to quantity or as to the period of fever, may allow the diseased changes to proceed without interruption to a fatal issue. It is, therefore, imperatively required of us, that we should determine, by attentive observation, both the exact period in which medicines of this description should be commenced with, and the particular substances that should be first employed. As respects the kinds of fever just alluded to, as well as those forms which are either nervous, or more uniformly putro-adyamic, at earlier stages, we are at no loss for means, which are both refrigerant and antiseptic, and which may be employed from the commencement, either when excitement is most excessive, or when it is entirely absent, if due care be taken in the mode of prescribing them. By this early attention, particularly in putro-adyamic and inflammatory putrid fevers, to those means which may best preserve the fluids from the changes they are apt to undergo, especially when these fevers are left to themselves, or injudiciously treated, the advanced stages are rendered much more mild and even manageable. The more refrigerant of the substances, formerly termed antiseptics, as nitrate of potash, nitrate of soda, muriate of ammonia, &c., when duly administered in the early course of fever, and combined with or followed by those which are more stimulant and tonic, as camphor, cinchona, chlorate of potash, arnica, &c., as exhaustion and signs of putro-adyamia appear, will generally prevent the more dangerous changes in the fluids from taking place. The *muriate of ammonia* is now seldom used internally, although HOFFMANN, JACOB, BARCHUSSEN, LOESECHE, TISSOT, WERLHOF, MONRO, HIRSCHL, HILLARY, M'CAUSLAND, GMELIN, and others, have recommended it highly in putro-adyamic fevers. I have frequently employed it; and Dr. CONWELL has found it of great service in the fevers of India. SCHMIDT prefers it in such cases as are attended by diarrhoea.

591. About the time when M. LABARRAQUE discovered the *chlorides of soda* and of *lime*, cases of fever of a putro-adyamic or malignant form were frequently occurring in an institution to which I am consulting physician. I had made

trial of various methods of treatment, but found camphor, in large doses, variously combined, and aided by other means according to the peculiarities of the case, the most successful of any. Shortly afterwards, M. LABARRAQUE's process for preparing these chlorides was published at Paris; and as early as 1825 I procured them from Mr. MORSON, for the use of this, and another institution, to which I was physician. I employed them internally, in enemata, and externally, and as disinfectants; and the results were such as have induced me to have recourse to them ever since, in the various circumstances and diseases in which I have recommended them in this work. The *chloride of soda* is a valuable medicine in all the typhoid forms of fever, when judiciously prescribed. It may be given early in the putro-adyamic variety, when excitement is imperfect or low, and the skin discoloured, or petechiæ are appearing, and continued throughout the disease. But when vascular reaction is considerable, or local determination prominent, particularly in the nervous and exanthematic varieties, this substance should be withheld, until these states are subdued, or about to lapse into the nervous stage. — At first it ought to be prescribed in small doses, so as not to offend the stomach — in from ten to fifteen drops of the solution, as prepared by LABARRAQUE, every three or four hours, in camphor julap or in an aromatic water. As the disease passes into a state of exhaustion or of manifest putro-adyamia, or when there are a lurid skin, low muttering delirium, stupor, meteorismus, black sordes on the tongue, teeth, &c., the supine posture, unconscious offensive evacuations, petechiæ, blotches, a disposition to gangrene in parts pressed upon, coma, &c., it should be given in larger doses, or more frequently, and in tonic infusions or decoctions, or with camphor, serpentaria, or other stimulants and tonics. I have seen it productive of great benefit in such cases; but it should be commenced before these symptoms appear, and be persisted in, as its good effects are seldom manifest in less than three or four days, or more; and it should not supplant the use of wine, opium, suitable nourishment, and other means which the stage of the disease and peculiarities of the case may suggest. It should also be frequently administered in enemata; and the surface of the body ought to be often sponged with a stronger solution of it in warm water, with the addition of camphor. M. CHOMEL has lately given the chloride of soda an extensive trial; and he states that it has proved more successful in low fevers than any other means, when perseveringly employed. Dr. GRAVES has also recently employed it, and has found it extremely serviceable. It acts, first, on the tissues with which it is brought in contact, as a gentle stimulant and antiseptic; and is most probably partially decomposed in the digestive organs, and reduced to the state of common salt. In this state it is carried into the circulation, where it supplies the waste of this substance that has taken place in the early stage of the disease.

592. The *chloride of lime*, in doses of one or two grains, may be also employed with great advantage. When exhibited in solution, it will be preferable to commence with half a grain every hour, or with a grain every two hours, gradually increasing the quantity as the stomach

such actually appears in some measure to have been the case. The truth, however, seems to be, that whilst pathologists have lately been occupied exclusively with the living solids, Dr. STEVENS has concerned himself only with the blood, and kept too much out of view the influence of life, especially as manifested in the organic nervous system, upon both the circulating and secreted fluids.

596. As far as my own observations enable me to form an opinion as to the respective merits of these acids, and of the alkaline subcarbonates and salts, I conclude—1st, That the *acids* may be of service early in fever, whilst vascular excitement is considerable, although vital power may be weak; that they seldom will be injurious in this period, as long as the skin continues warmer than natural, and the blood preserves its colour; and that but little confidence should be placed in them when the surface is at, or below, the natural temperature, or materially discoloured, unless they be conjoined with substances calculated to excite the powers of life. 2d, That the *subcarbonates of soda and potash*, the solution of *chlorine*, and the *chlorides*, are preferable in the middle and latter stages, more especially when the blood appears morbid, the skin discoloured, and the excretions offensive; but that the subcarbonates should not be trusted to in the last stages of typhoid fevers, unless conjoined with substances calculated to support the vital energies; and that, at this period, *chlorine*, the *chlorates*, and *chlorides*, should be preferred, as being more tonic, stimulant, and antiseptic than the carbonates. 3d, That the *sulphate of soda*, the *phosphate of soda*, and the *sulphate of magnesia*, are severally of service in the stage of excitement, when they may be given, at first so as to act gently on the bowels, and afterwards in small doses, as refrigerants, or alteratives; and that the *muriate of potash*, the *citrates*, and *acetates* may likewise be employed with the latter intentions. And, 4th, That circumstances may occur, in which it will be advantageous to exhibit the neutral salts with either an acid or an alkali, as the muriate of soda; with a vegetable acid, as prescribed by MOROAN; or with soda, as advised by STEVENS; or to prescribe saline substances with an excess of either of their constituents, as the muriates with an excess of acid or of alkali.

597. *i. Opium, &c.*—Much difference of opinion has existed as to the propriety of giving opium in typhoid fevers. But when we find SYDENHAM, POLIDORI, ROLFINCK, SCHLEGEL, VAN HOVEN,

and imperfectly renewed air; the constant evaporation from the too frequently washed decks; water kept in wooden casks until it became blackish, inky, stinking, and nauseously putrid; were causes often in protracted and simultaneous operation. I have never been in a ship in any other capacity than as a passenger; but some of my voyages have been long, and have afforded me occasions of witnessing, even at the commencement of the nineteenth century, the existence of some of these causes. For many years matters have been altered, especially in the navy. The mutiny at the Nore; the advance of knowledge; the stricter attention to the supply, preparation, and quality of the provisions; the preservation of water in iron tanks, and some other subordinate circumstances; have done more to banish putrid fevers and scurvy from our fleets, than the use of citric acid or any other antiscorbutic or antiseptic; and I have no doubt that the prevention of these causes, and the general adoption of the chlorides, will be found the most certain means of preventing and of curing these diseases.

HOME, HORN, MARCUS, LATHAM, STOKES, GRAVES, &c. favourable to the practice, the grounds of dissent from it ought to be carefully examined. There are circumstances and states of fever which forbid its use, but there are others which as imperatively require it; and I believe that the objectors err grievously in not discriminating between them, and in not studying either the conditions which contra-indicate it, or the modes of exhibiting it in the cases that would be benefited by it. SYDENHAM considered that it prevented coma, or stupor, when given after vascular and alvine evacuations had been judiciously employed. ODRELIUS, GILCHRIST, HOME, and GRAVES combined it with antimonials; and the propriety of the practice cannot be doubted, in the circumstances in which they employed it. In the present day, the indications for the exhibition of opiates have been so ably stated by two accomplished physicians—Dr. LATHAM and Dr. W. STOKES—that whatever I may advance as to this subject must in great measure be an echo of their observations. When the disorder of the sensorium outruns the other symptoms; when by venæsection or topical bleeding, or by alvine evacuations and refrigerants, the general and local symptoms are relieved, but the delirium still continues; when to this state are added, tremors, subsultus tendinum, and unrestrained evacuations; when there has been at first high vascular excitement, and large evacuations have been required to guard the brain or other organs from mischief, and wild delirium has followed; if the patient has previously been in a delicate or nervous state; if he has been addicted to an excessive use of spirituous or vinous liquors, particularly the former; if the habits of the patient and his occupations have been such as to inordinately excite and exhaust the sensorium; or if the anxieties, the toils, or the debaucheries of life have previously injured the health, and more especially the state of nervous energy;—in these several circumstances, should opiates be resorted to, in the advanced progress of typhoid fever, and of synchoid fever that has passed into the nervous or typhoid state. On most of these, Dr. LATHAM has insisted with great precision and force; and I entirely subscribe to the value of his remarks. Dr. STOKES remarks, that three circumstances call for the use of opium in fever: 1st, Where there is persistent watchfulness; 2d, Where an inflammatory condition of the brain has existed, and been subdued, but delirium or other nervous symptoms still remain; 3d, Where an excited state of the sensorium exists without heat of scalp, or remarkable throbbing of the arteries of the head; and to these I may add a fourth, Where there is much relaxation of the bowels, unrestrained evacuations, tremors, watchfulness, or delirium, or subsultus tendinum.

598. The *modes* of exhibiting opiates is sometimes of great importance. In many cases, one or two grains of solid opium may be given, either alone, or with camphor and nitrate of potash. The combination with camphor is to be preferred, when there is much adynamia, and no inflammatory determination to the brain. When the bowels are very remarkably disordered, ipecacuanha may be added to these. The *acetate of morphine* is often superior to pure opium, when given in doses of from a quarter to half a grain, with camphor.

sentieric glands, are not unusual, particularly when the patient has been prematurely exposed to changes of weather, to irregularities of diet, &c., and when the treatment has been injudicious, during early convalescence, or too soon relinquished. In all the varieties, the risk of these affections is increased by the complications which the fever presented; the organ which was prominently deranged remaining longer weak, or more susceptible, than others, of being disordered by excitation, or by injurious agents. Therefore, in cases where the predominant disorder has been expressed on the encephalon, particular care should be taken to preserve the sensorial functions from early excitement or irritation, or undue exercise. Where the respiratory organs have been much affected, premature exposure to cold, or to changes of temperature, &c. ought to be guarded against; and where the digestive organs have manifested the onus of morbid action, the return to a full or stimulating diet should be long delayed, and the most digestible food only ought to be taken, and in moderate quantity. (See further on this subject, § 167—170.; and art. DEBILITY, § 36—46.)

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FEVER, PUERPERAL; see PUERPERAL DISEASES.

FEVER, SCARLET; see SCARLATINA.

FEVER, YELLOW; see PESTILENCES.

FIBROUS TISSUE — ALTERATIONS OF THE.
CLASSIF. — SPECIAL PATHOLOGY — *Morbid Structures.*

1. A. The Fibrous System consists — 1st. Of fibrous membranes — *membræ fibrosæ* — as the periosteum, the cerebral and spinal dura mater, the fibrous capsules, the sheaths of tendons, the aponeurotic expansions, the sclerotica, the capsule of the corpora cavernosa penis and of the clitoris, &c., the tunica albuginea, and the membranes proper to the spleen and kidneys; — 2dly. Of fibrous cords, in which the fibres are formed into fasciculi — *organa fibrosa fascicularia*. — Several of the former should be viewed as compound structures; as the dura mater, the tunica albuginea, the fibro-synovial sheaths, &c.; but the fibrous tissue constitutes their chief basis. With the exception of the fibrous membranes of a few glandular organs, it is easy to demonstrate that all the fibrous structures are connected together, and that the periosteum is the centre and basis of connection. This tissue consists of whitish, or grayish, shining, satiny, fibres of great fineness and strength. These are interwoven in various directions, in the first division of this tissue; and are placed parallel and very

close to each other, in the second. Their cohesion is very great. Hence the fibrous tissue is the strongest in the body. Although it must be inferred to possess vessels and nerves, yet neither have been actually traced into it. That it is endowed with vital properties cannot be denied; but it manifests them obscurely in health, but often very remarkably in the course, or as a consequence, of certain diseases. Its physical properties are most perfect when the powers of life are energetic, and are much impaired when these are depressed or exhausted. During prolonged debility, and in cases of extreme vital exhaustion, the cohesion of this tissue is diminished, and laceration or extension of it takes place with less violence. During constitutional disorder, or contamination of the system by specific maladies, and in the scrofulous or gouty diathesis, it often becomes the seat of morbid action, and then evinces vital properties in a most evident manner. Injuries and irritations of this tissue, particularly when the vital functions are impaired or disordered, are often the source of the most violent and dangerous affections. — The fibrous tissue, however, is, with the exception of the periosteum and the capsules of joints, not very prone to disease; and, even when these are affected, a scrofulous or syphilitic taint has been the cause.

2. B. Leaving out of consideration the congenital alterations of this tissue, I will briefly notice those changes of it which are usually the result of disease. — a. Fibrous parts are seldom thinner than natural, or atrophied. — b. Thickening is much more frequent, and is evidently the result of slow inflammatory action. — c. They may also be expanded or distended by morbidly increased bulk of the organs which they envelope. We occasionally meet with this change in the fibrous coverings of the spleen, kidneys, articular capsules, &c. When the expansion arises from the accumulation of fluid, it is generally attended with thinning; and then, in some cases, the distension is chiefly in one part only, in the form of a sac, or is irregularly elongated. But the expansion may also be conjoined with thickening, as when it has proceeded from the changes consequent upon an inflammatory state of the contained parts, in which the fibrous envelope itself had participated, as in diseases of the spleen, &c. — d. The articular ligaments and capsules, however, are frequently elongated and expanded without any internal change, and merely from diminished tone or vital cohesion — in some cases so much so, as to give rise to dislocations. — e. Fibrous parts may be also too short or too narrow. Morbid contractions are observed in tendons and ligaments, and are generally the result of inflammatory irritation consequent upon great extension, cramp, &c. — f. The changes of colour met with in this structure are generally associated with change of organisation, excepting in jaundice. The morbid colours most frequently observed, are various shades of yellow, seldom brown, and rarely black, as in melanosis.

3. C. The continuity of this structure is sometimes destroyed; but generally from wounds, sudden extension, as in dislocations, and external violence of any kind. Continuity may likewise be destroyed by purulent collections, by tumours, and various morbid depositions between its fibres; but there is here, with a few exceptions, rather

gelatinous fluid, or ichorous pus. The internal articular ligaments, the cartilaginous coverings of the bones, and the synovial membrane are entirely or partially destroyed. The bones either primarily or secondarily affected are, in a greater or less degree, inflamed, softened, swollen, and become, internally carious; or they are but little swollen, tolerably hard, yet superficially eroded, or destroyed by caries. Owing to this carious state of the heads of the bones, whether attended with swelling or not, dislocation takes place. The articular cavity contains at first a large quantity of thickish, albuminous-like, often a pale reddish synovia; and, in later stages of the disease, if the joint be more or less destroyed by suppuration, a thin, frequently foul-smelling, pus, mixed with blood, cartilage, and cartilaginous fragments, fill up entirely or partially the cavity of the joint (Otto).

9. *B. Ossification* is frequently observed in the fibrous structure, particularly in the ligaments and dura mater, and less frequently in the periosteum, the tendons, the fibrous membrane of the spleen; and but rarely in the other parts of this system. It is to be viewed as a consequence generally of slow inflammation, and occurs in different forms: as in some cases only the fibro-cartilaginous base of bone is deposited in plates or roundish-flat prominences; more frequently phosphate of lime is secreted either in distinct spots or small masses surrounded by a circle or plexus of vessels, or in the form of splinters, or, lastly, in larger masses, involving the fibrous tissue equally throughout. If the articular ligaments undergo this change, they are then usually *shortened*, occasioning *stiffness* of the joint, or more or less *complete anchylosis*, according to the extent of the ossification. An *earthy mass*, less resembling bone than chalk or gypsum, consisting principally of the urate of soda — *gouty tophus* — is often deposited in the ligaments, in the neighbouring aponeurosis, and periosteum of one or several joints, in gouty persons, at first in a soft state, but gradually becoming hard, and often in large quantity.

9. *C. Sphacelation, or gangrene*, rarely occurs as a termination of inflammation. It is met with primarily in those fibrous parts which are well supplied with blood-vessels, viz. the periosteum, dura mater, fibrous envelope of the spleen, &c. In the tendons, aponeurosis, and articular ligaments, it very rarely occurs primarily, excepting when they are exposed to the air by wounds or ulcers, in which case they often are destroyed and exfoliate together with the surface of the bones and cartilages. Fibrous structures, however, are often attacked with mortifications in conjunction with, or in consequence of, gangrene of the adjoining parts. Anthrax sometimes extends to and destroys fibrous tissues; and when mortification attacks a limb, the articular ligaments participate so entirely, that a spontaneous separation often takes place at a joint.

10. *D. Adventitious productions* are but rarely observed in the fibrous system. — *a. Encysted tumours* seldom form in it, if we except those bursal tumours which occur on the tendinous sheaths and articular capsules, and partly between the tendinous fibres of the aponeurosis, and especially on the elbow-joint and knee-cap, and which have their origin in the mucous bags placed in these situations. — *b. Tubercular formations* are equally rare in fibrous parts. Scrofulous deposits

are, however, occasionally found in the dura mater and periosteum. — *c. Sarcomatous and fungous tumours* are more frequent in fibrous structures, particularly in the periosteum. Fungous growths on the tendons are more rare, as are the sarcomatous swellings upon the articular ligaments. — *d. Carcinoma, or cancer*, does not occur primarily in this system, but attacks it secondarily equally with other parts.

11. *E. The changes observed in the contents of cavities formed by fibrous membranes* are frequently marked and important. Morbid collections, as a watery serum, a gelatinous fluid, puriform matter, blood, &c., are not infrequently found in the aponeurotic sheaths surrounding or separating the muscles in the cavities of joints. The *synovia* also varies exceedingly; sometimes it is deficient in quantity, so much so as to occasion stiffness, creaking or a peculiar noise of the joint. More commonly it is in unusual quantity, particularly in all inflammatory states of the synovial membrane, but occasionally without any distinct inflammation, as in the knee-joint, in rheumatic, rickety, or syphilitic subjects. Sometimes the effusion exists to such a degree that the joint is more or less swollen, or even dislocated, or its use prevented. This local state of disease has usually been called *dropsy of a joint*, *hydrops articulorum*, *hydrarthrus meliceria*. The synovia is occasionally turbid, reddish, watery, albuminous, gelatinous, &c., as well as increased in quantity.

12. *F. Substances adventitious to the situation* have occasionally been found in the cavities of joints — *a. Blood* is rarely observed; but — *b. Pus* occurs more frequently, it either having been produced within the joint itself, from an acute inflammation of the synovial membrane, and of the bony cartilages and ligaments forming the joint, or having made its way into the cavity from without. I have, however, seen cases where pus has rapidly collected in one or more joints after *phlebitis*, or after the absorption of this fluid from other and distant parts. It has been supposed, that the pus, in such cases, has been secreted or deposited in the cavity of the joint, as it has passed into the circulation from the situation where it was primarily formed, without previous inflammation of the joint itself. But the presence of this morbid secretion in the blood may have excited inflammatory action of the synovial membrane, rapidly passing into the suppurative stage. In most of such cases, the parts containing the pus have been found eroded, and have presented other changes usually consequent upon inflammation, even when vascular injection has been abated. The question is, whether such changes have taken place previously or subsequently to the secretion of pus in the joint? That the more advanced of them are consequent upon the production of this fluid may be admitted; but that inflammatory injection and action preceded, and quickly produced, the purulent collection, seems most probable.

13. *c. Cartilaginous concretions*, which have grown from the inner or expanded surface of the synovial membrane, by necked appendages, and been subsequently broken off, are occasionally found in the cavities of joints, either entirely loose, or attached to them by thin threads. They are at first soft, then mostly cartilaginous, sometimes partly cartilaginous and bony; more rarely altogether bone; usually rounded, but occasionally

it tends either to induce or to aggravate.—*A. Primary or idiopathic flatulency of the stomach* is met with chiefly when the stomach is empty, or after the process of digestion in this viscus is completed; and is seldom associated either with impaired appetite, or diminished powers of digestion. It is most troublesome in the morning before breakfast, or during long fasting; or when an unusually protracted period has elapsed between meals. In such cases, the flatus often rises into the œsophagus, producing much uneasiness and often distress, owing to its excretion being prevented by the spasmodic constriction of the upper part of this tube. In swallowing also the more solid ingesta, the bolus meets the flatus in the œsophagus, and is interrupted or impeded in its passage to the stomach. In such circumstances, a conflict sometimes arises between the descending ingesta and the ascending flatus, and a very painful *spasmodic dysphagia* is thereby induced, until the eructation of air gives relief and allows the transit of the bolus into the stomach. In this form of the disorder, the air most probably is exhaled, at least in great part, from the internal surface of the organ. In other respects the patient's health is not deranged, and the functions of digestion, defæcation, and assimilation are regularly and perfectly performed. In other instances, slight defect of organic nervous power, owing to sexual indulgences, or to sedentary occupations, is the only pathological state to which this affection can be imputed.

5. *B. The remote causes* of flatulency are the nervous and hypochondriacal temperaments; and all the influences and habits which depress or exhaust the energy of the organic nervous system, or lower the tone of the digestive canal, especially sedentary occupations; excessive mental exertion and anxiety; venereal indulgences; intemperance in eating and drinking; the ingestion of cold fluids, particularly when the body is overheated; exposure to a cold air, or to cold in any way, whilst the stomach is empty, or whilst fasting; neglect of the functions of the bowels; the use of bulky or flatulent vegetables, or of fruits prone to undergo fermentation, especially cucumbers, melons, salads, &c.; irregularities of diet; and previous or existing disease.—*Fast eating*, and imperfect mastication, often give rise to flatulency, by the quantity of air which is generally swallowed on such occasions, and by the imperfect or slow digestion which usually results.

6. *C. Symptomatic flatulency of the stomach* is extremely common.—(a) It is almost a constant attendant upon indigestion; and (b) often accompanies general debility.—(c) It is also frequent in *hypochondriasis* and *melancholia*; (d) and in the numerous forms of *hysteria*. In this last, the flatus often rises into the œsophagus; and whilst the reaction of the coats of the stomach propels it into this tube, spasmodic constriction of the part just below the pharynx confines it for a time, and causes a distressing feeling of suffocation, &c.—(e) Flatulency is an almost constant symptom of *inflammatory* and *organic affections* of the stomach.—(f) It generally ushers in an attack of *gout*;—and (g) it both precedes and attends *asthmatic affections*.—(h) It is a common phenomenon of all the functional, inflammatory, and organic diseases of the liver; and is very characteristic of accumulations of bile in the gall

ducts and gall-bladder; and of *torpor of the biliary organs*.—(i) It often, also, occurs in the functional and inflammatory disorders of the bowels, and sometimes in affections of the other abdominal viscera.—(k) It not infrequently even accompanies *chronic diseases of the brain*;—(l) and the *adynamic* and *malignant forms of fever*.

7. *D. The phenomena* usually characteristic of flatulency vary somewhat with the diseases of which it is a symptom. In the course of digestion, flatus escapes with or without noise, and often with an acid, bitter, midorous, or foetid odour. Sometimes it is without either odour or taste; and at other times it retains the smell and flavour of the ingesta. When constriction of the cardia, or of the lower part of the œsophagus, prevents eructations, or when the coats of the stomach are so weakened, or so over-distended, as to be incapable of reacting sufficiently, *typanitic fulness* of the epigastrium and hypochondria, with a painful sense of distension, or severe *gastrodynia*, frequent respiration, and heavy pain or oppression in the lower parts of the chest, are generally complained of. If eructations occur, especially for some hours after a full meal, acrid or rancid matters, or portions of undigested food, are frequently regurgitated at the same time, and impress the palate and pharynx with an acrid and irritating sensation, or produce an unpleasant, dry cough, by affecting the epiglottis and larynx. *Cardialgia* is then often associated with this symptom, or precedes the eructations. When flatulency precedes or attends organic lesions of the stomach, or obstructions of the liver or pancreas, the symptoms caused by, and associated with, it are often severe. Disordered action of the heart, anxiety, hiccup, *gastrodynia*, &c. being not uncommonly observed.

8. *E. The disorders induced or aggravated* by flatulency of the stomach, are various in different habits and constitutions. When the stomach is much distended by flatus, and especially when the œsophagus admits and retains for a time the air in its lower part, the feeling of oppression, dull pain, and the other symptoms just mentioned, are much increased. The actions of the diaphragm are impeded, and the regularity of the circulation through the cavities of the heart is interrupted by the pressure of the over-distended organs. Hence the intermissions and irregularities of the pulse, the sense of anxiety, flutterings, feeling of suffocation, and palpitations, so often associated with, or consequent upon, affections of the digestive organs. *Wherry* attributes *incubus* to flatulency of the stomach, and, I believe, very justly. In delicate, nervous, and hysterical females, various symptomatic disorders, besides those now stated to arise directly from this cause, are often experienced. The modes of dress, particularly the very strait corsets used by this sex, aggravate the disorders consequent upon flatulent distension.—Severe pains of the left side, congestions of the lungs, or of the brain, headachs, convulsions, faintness, vertigo, and several anomalous complaints, often thus originate, not only in females, but also in males, especially those who are sedentary, hypochondriacal, and debilitated. In this class of persons more particularly, the pressure of the distended stomach prevents the due action of the bowels, and either impedes or interrupts the passage of fecal matters from

ation of air in serous cavities is never, I believe, observed, excepting as a result of inflammatory action in some part of their surface that has given rise to a secretion of a sero-albuminous fluid; and it is not improbable that the air is produced by the partial decomposition of the albuminous portion of the secretion. These occurrences are more particularly noticed in other places.

15. V. TREATMENT. — A. In the *primary states* of the disorder, attention to *diet*, and gentle *tonics*, with mild *aperients*, will generally restore the healthy functions of the stomach and intestines in a short time. If much distress be experienced from the retention of the flatus, the addition of a *carminative* spirit or oil, as those of anise-seed, pimenta, nutmeg, or cardamoms, to the above, will give relief; but the frequent use of heating spices may be injurious in other circumstances, particularly if the complaint depend upon chronic inflammatory action of the digestive mucous surface, as is frequently the case. The practice of rejecting the air, either upwards or downwards, should not be indulged in, for, although momentary relief is thereby obtained, an increased disposition to generate it is produced, and the evil augmented. It is only when air collects to the extent of producing much disorder, that its expulsion should be procured. — In this case, any of the numerous carminatives in common use may be given, if they be not contra-indicated by the presence of inflammation. In some such instances, however, the more energetic of them may be exhibited with advantage in enemata. The extract of *rue*, or any of the *essential oils*, may be thus prescribed. — HUFELAND and others advise warm dry *aromatic epithems* to be applied over the abdomen in these cases; and THUNBERG recommends the *cajeput oil* to be rubbed upon this part, or to be given internally, when the state of the circulation and of the animal heat indicates the propriety of exhibiting carminatives. — *Charcoal*, as suggested by J. P. FRANK, and *magnesia*, if not the most efficacious, are among the safest means that can be used. The same may be said of *camphor*, and the *terebinthinates*, and the plants which owe their efficacy to either of these principles. The *subnitrate of bismuth* is often of great service, particularly when conjoined with small doses of *ipécacuanha* and *hyoscyamus*.

16. Whenever flatulency of the stomach or bowels is unconnected with inflammatory action—when the pulse is soft or weak, or not increased in frequency, when the abdomen and hypochondria are not painful on pressure, when the tongue is moist, or pale, and not red at its edges, and when there is no unusual thirst—then carminatives, antispasmodics, stimulants, and tonics, combined with one another, and with absorbents and aperients, will give relief; and they may be either given by the mouth, or administered in enemata. — But even in these cases, our chief dependence should be placed upon suitable tonics, with the use of the cold salt-water bath, and attention to the secretions and excretions, for the cure of the complaint. — If an attentive view of the case suggests the existence of inflammatory irritation in any part of the alimentary canal, the *nitrate of potash*, and the *subcarbonate of soda* or of potash, with *demulcents* or *emollients*, and weak camphor mixture, will be most appropriate. In these cases, external *derivatives*, gentle frictions

of the abdominal surface with warm *rubefacient liniments*, as recommended by WYRR, the application of hot *terebinthinate embrocations* or *epithems*, or fomentations as used by DARWIN, will be of great service. When the complaint is connected either with slight inflammatory action, or with imperfect secretion, especially of bile; or with both, as observed in numerous instances; *deobstruents*, and *mild purgatives*, will be required. In such cases, the blue pill, or PLUMMER'S pill, or the hydrargyrum cum creta, ought to be given at bedtime, with soap, *ipécacuanha*, and *taraxacum*.

17. B. *Flatulence in infants or young children* ought to be treated chiefly by appropriate food and regimen, and by mild purgatives. *Magnesia in dill-water*, or in *fennel-water*, or in *anise-seed water*, will frequently give relief; but an alternative, as the hydrargyrum cum creta, will generally be required on alternate nights. The warm or tepid bath, followed by frictions of the abdomen with some warm liniment; enemata with a little common salt, and some carminative water; and an occasional dose of castor oil, with warm clothing, and pure dry air, will also be productive of benefit.

18. C. In the more decidedly *symptomatic states of the complaint*, the treatment should be chiefly directed to the disease on which it depends. But in these states it is generally most urgent, and hence requires the adoption of means calculated to procure immediate relief. If those already described, employed according to the peculiarities of the case, prove inefficacious, it has been recommended by REICH, PAMARD, THILLOU, and PIGNY, to draw off, or to facilitate the escape of, the flatus, by a siphon, or by the introduction of a flexible hollow tube into the rectum. In most instances of difficulty, I have found the *terebinthinates* with aperients, enemata with either spirit of turpentine or extract of *rue*, and *terebinthinate embrocations* or liniments applied to the abdomen, succeed in procuring the expulsion of the flatus, by exciting the action of the muscular fibres of the canal. — When this complaint depends chiefly upon debility, and is associated with other disorders proceeding from this source, the means advised in the articles COLIC, CONSTIPATION, and DEBILITY, according as it may present more or less of the features of either, should be prescribed; and *diet* and *regimen* ought to receive due attention.

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motion; a feeling of uncomfortable weight gravitating to the side on which the patient lies, and of general uneasiness and coldness in the lower part of the abdomen; flaccidity of the abdominal parietes subsequent to a certain degree of tension; foetor of the breath, pallor of the countenance, lividity of the eyelids or surrounding circle, and flaccidity of the breasts; generally denote the death of the foetus; and when the pulsation of the heart cannot be heard on auscultation, this event may be inferred with certainty.

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FUNGOID DISEASE. — **SYN.** *Hæmato-cerebriform Disease*; *Milt-like Tumour*, *Monro*. *Soft Cancer*, *Auct. var.* *Spongoid Inflammation*, *Burns*. *Medullary Sarcoma*, *Abernethy*. *Carcinoma spongiosum*, *Young*. *Fungus Hæmatodes*, *Hey*, *Wardrop*. *Fungoid Disease*, *A. Cooper*. *Fungus Medullaris*, *Maunoir*. *Matière cérébriforme*, *Auct. Gall.* *Carcinome mou et Spongieux*, *Roux*. *Tumeur Encéphaloïde*, *Laennec*. *Fongus Médullaire*, *Lobstein*. *Carcinus Spongiosus*, *M. Good*. *Carcinome Sanglante*, *Cancer mou*, *Fr.* *Der Blutschwamm*, *Germ.* *Bleeding Fungus*.

CLASSIF. — 3. Class, Sanguineous Diseases; 4. Order, Cachexies (Good). IV. CLASS, IV. ORDER (Author, in Preface).

1. **DEFIN.** — A tumour, or tumours, consisting of a whitish, pulpy, brain-like substance; generally soft, circumscribed, elastic, or obscurely fluctuating; giving rise to large vascular growths, which bleed profusely; always connected with constitutional vice; contaminating the frame, and terminating fatally.

2. i. **DESCRIPTION.** — This is the most malignant formation to which the body is liable. When it appears covered only by the integuments, and has not yet acquired considerable bulk, the surface of the tumour which it forms is smooth, generally equal, and not discoloured; it is commonly soft and elastic, and communicates to the touch an obscure sense of fluctuation. When removed from the body, the hæmatoid tumour is generally circumscribed, and more or less rounded; it frequently possesses a capsule of condensed cellular membrane. — *A. M. LAENNEC* has divided the disease into, 1st, the encysted; 2dly, the irregular and non-encysted; to which he has added, 3dly, the interstitial impregnation of organs by the cerebriform substance. This last is not mentioned by *Mr. WARDROP*, who has described this disease

with great accuracy. *M. LAENNEC* has never met with it in the lungs. It may be, therefore, considered as a rare form of the disease. When divided, the substance soils the knife, and is composed of an opaque, whitish, homogeneous matter, resembling, in colour and consistence, the cerebral pulp. Hence the name, *Encephaloid*, given it by the French pathologists. It softens after exposure for a short time to the atmosphere; and when the softer part is washed away, or when the mass is compressed, a filamentous or fine cellular tissue remains.

3. **B.** The consistence of the hæmatoid tumour varies in different cases, and sometimes in different parts of the same mass — being sometimes more dense than the firmest brain, at other times as soft as the brain of a foetus, as the milt of a fish, or even not much firmer than custard. According to *M. LOBSTEIN*, the different degrees of softening is owing to the progress of the disease; and this appears to be generally the case. In the first stage, or that of crudity, the melanoid tumour has the consistence of a firm brain, or of the conglobate glands; in the second, the consistence is less, being that of the foetal brain; in the third, it approaches that of milt or custard: to these may be added a fourth, when the tumour is situated externally, or near the surface of an organ or part, viz. that attended with ulceration and the rapid production of bleeding fungi from the ulcerated part.

4. **C.** The colour of this production varies sometimes in the same mass. It is commonly of the colour of the brain; occasionally portions of it are redder, and exhibit more of a fleshy appearance; and in other cases, parts of it resemble a clot of blood. When the hæmatoid mass is encysted, it is readily detached from its capsule; and, in the early stage, is often divided into several lobes, placed closely together, and separated by an extremely fine cellular tissue, which seems to convey the vessels for its nutrition. In the advanced stages, the division into lobes disappears. The non-encysted form is, however, more common, particularly in the viscera. The masses constituting this formation vary from the size of a pea to that of the head of a foetus at the full time.

5. **D.** The medullary structure, although the general, is not the only, form observed in the primarily diseased mass. Some of the fungoid productions are composed of distinct parts provided with cellular capsules, and differing in size, colour, and consistence. Some of these parts resemble slightly softened glue; others have earthy particles mixed with the pulpy cerebriform matter; many present insulated portions of the colour and consistence of boiled yolk of egg. As the tumour increases, the softening and disorganisation characterising the successive stages of its growth takes place. Disorganisation generally commences in the central parts: cavities now form in it, chiefly containing blood; and, when the blood is washed away, and the tumour is placed in water, numerous membranous shreds and filaments are seen floating in these cavities.

6. If the fungoid mass is situate near the surface of any internal viscus, discolouration of, and adhesion to, the part covering it, followed by ulceration, take place. But the ulcerative process, instead of giving rise to loss of substance, produces a fungous growth, and, as well as when the tumour forms exteriorly, the increase of bulk, which had hitherto been slow, now becomes rapid.

progress of the disease may be divided into four stages. — In the *first*, the tumour has the consistence of the conglobate glands; in the *second*, it is much softer; in the *third*, the softening is still greater, and amounts to a state of semi-liquefaction, and gives the sensation of fluctuation; in the *fourth*, ulceration or vascular fungi arise. — Signs of general cachexy appear in the second or third stage, and are very decided in the fourth. — *b.* The duration of this malady is generally some months at least; and it may continue for two or three years. In the early stages, it is not usually attended by febrile action, or much pain; and it may exist for a considerable time without occasioning emaciation; but there is always more or less debility. Acceleration of pulse, and emaciation, appear in the advanced stages, often accompanied with effusion into the adjoining cavities, particularly when an internal organ is the seat of the malady, as the liver, uterus, &c. — In the *third* and *fourth* stages, the vital functions are very manifestly affected. The stomach loses its power, or rejects the ingesta. The patient experiences most severe pain; and the energies of life decline. The complexion often assumes a livid, earthy, or peculiar yellowish hue, or pale straw colour; the pulse becomes smaller and weaker; and at last the patient sinks, generally without either delirium or insensibility having existed for any considerable time before death.

13. *iii.* DIAGNOSIS AND COMPLICATIONS. — This disease was confounded with cancer until the commencement of this century, when BURNS and HAY first remarked the difference between them. They are still considered by some Continental pathologists, and by Dr. CARSWELL, as varieties or modifications of the same constitutional malady; and there are several circumstances which both favour and militate against this opinion. They both occur in similar habits of body and temperaments; they often arise spontaneously, or without any manifest cause, or are traced to the same exciting agents; they are both dependent upon constitutional vice, as well as upon perverted organic action and secretion in their seats; and they both undergo somewhat similar local changes, and occasion an increasing contamination of the fluids and soft solids. Moreover, as I have stated in another place (see article DISEASE, § 141—144.), and as Drs. KERR and CARSWELL have justly remarked, both may co-exist, or the carcinomatous may pass into the fungoid formation. Dr. CARSWELL observes, that numerous examples might be given of scirrhus, medullary sarcoma, and fungus hæmatodes, as they are commonly called, originating in the same morbid state, and passing successively from the one into the other in the order in which they have been named. Indeed, these varieties are sometimes met with, not only in different organs of the same individual, but even in the same organ.

14. The points, however, of dissimilarity are very striking, as remarked in the article referred to (§ 141—144.); and, notwithstanding these circumstances, are sufficient to constitute them distinct diseases. As these points have not been brought into view by the able writers just mentioned, and as they deserve a fuller notice than I have bestowed on them in the sketch indicated above, I shall here state them more fully. — *a.* There is no relation between the hard, incom-

pressible texture of scirrhus, in which carcinoma commences, and the cerebriform, elastic, and soft substance constituting fungoid disease. — *b.* Carcinoma commences in scirrhus, which confounds in one mass all the tissues which it invades, and often without much increase of bulk, although with augmented density; fungoid disease always consists of a more or less evident tumour, which seems to destroy every trace of any other structure. — *c.* Carcinoma, even in an advanced stage, when fungous projections sprout from its ulcerated parts, presents but little vascularity; whereas the fungoid disease possesses large vessels, and vascular cavities, so that it derives one of its most common names from this circumstance. — *d.* Fungoid disease attacks organs in which true carcinoma has not hitherto been seen to originate; as the lungs, the liver, the brain, the spinal cord, and the nervous trunks. — *e.* Cancer affects the aged, fungoid disease the young; and the former is attended with more pain at the commencement than the latter: — and, *f.* as, MM. MAUNOIR, LONSTON, and VELPEAU have remarked, there is something peculiar in the cachexy attending carcinoma, that is not observed in the fungoid malady; for it is not unusual to see persons, labouring under this latter affection, possessing their natural colour. This, I believe, occurs most frequently when some external part only is affected, or when the disease has not invaded the digestive or assimilating organs, or when absorption of the morbid matter has not taken place to a great amount. In a case now under my care, the healthy complexion is preserved, and yet neither the able practitioners who have seen it, nor myself, have any doubt as to its nature.

15. M. LONSTON asks, with reference to the question of the identity of these two maladies, whether, admitting that true cancer sometimes gives rise to the fungoid formation, it therefore follows that this latter is the same as cancer? May there not exist, simultaneously, tuberculous degeneration of the lungs, fungoid disease of the liver, and fibrous tumours in the womb, without inferring the identity of these three morbid formations? Fungoid disease, therefore, appears, from its vascular relations, from its peculiar structure, and from its early characters, its advanced course and terminations, to be a distinct malady, although it may be consequent upon, or complicated with, other alterations of structure. When it occurs in young subjects, it is always primary, or is not preceded nor attended by the carcinomatous formation. But in persons past the meridian of life, in whom only scirrho-cancer or carcinoma is met with, the fungoid structure is sometimes produced consecutively, or in an advanced stage of it, and thus occasionally exists as a secondary complication with that disease, or as one of the advanced changes of structure consequent upon the constitutional vice. The question, therefore, as to difference is reduced to this, that, when fungoid disease attacks young persons, it is always a primary and distinct malady; and that, when it affects persons advanced in life, it is either primary, or consecutive of, and complicated with, carcinoma (see art. DISEASE, § 141—144.). In a few instances, other morbid formations besides this have been found associated with the cerebriform structure, as fibrous tumours, scrofulous

organ;—and, 3dly, That it is met with in vessels having no direct communication with an organ affected with the same disease. The veins, however, and venous capillaries, are the only parts of the vascular system in which the diseased substance is found—sometimes in contact with the internal surface of the vein, or occasionally united with it by means of thin colourless fibrine, or even of very minute blood-vessels, as in the case of the cerebriform matter. In the articles referred to, I have stated that, when this morbid substance is detected in the blood, it has been absorbed, as in the case of other morbid secretions; and the accuracy of the opinion seems to be supported by the fact, that it is found only in the veins and absorbents; but Dr. CARSWELL believes that this is not the case, as there are instances in which the venous blood alone was the seat of the disease. If such be actually the case, an obvious difficulty presents itself; but various sources of deception arise in the course of minute researches, and mislead even the most careful. That the blood is early affected in this and other malignant diseases, I fully believe; but that the cerebriform matter is formed in it, and afterwards deposited in the parts which are its seats, cannot be supported by the history and progress of the local and constitutional affections. If it were previously formed in the blood, wherefore is it often deposited only in one situation?—wherefore is it not excreted by the emunctories?—wherefore does it not always affect a number of parts simultaneously?—wherefore is it never found in the arteries, and so frequently in the absorbents and veins proceeding from the seat of disease?—These, and other questions that may be asked, cannot be answered consistently with this doctrine. I therefore entertain the same opinion as was stated by me in the articles already referred to, and believe that, like carcinoma, it essentially depends upon a debilitated and otherwise morbid state of the system generally; and that the vital actions of the part or parts primarily and especially affected are depraved—that the nutrition, organic sensibility, and the secreting function of these parts are remarkably altered, and that the morbid product which results is partially absorbed into the circulation, and contaminates the fluids and soft solids, sometimes exciting a similar morbid action in other situations.

20. Conformably with the best ascertained facts connected with the appearance of the cerebriform matter in the vessels, it would seem, that, at a somewhat advanced stage of the disease, or when this structure becomes more or less softened, the molecules of it pass into the veins and absorbents leading from the part in which they have been formed; that they there sometimes are aggregated into masses sufficiently large to admit of their recognition; that, although these masses are generally found merely in contact with the internal surface of the veins, they sometimes adhere to it by means of the fibrine which collects around them, as in every other instance in which a semifluid or partially concrete substance, or a secreted matter of greater consistence than the blood, passes into the circulation; and that, when they thus adhere to the internal surface of the veins, minute vessels are ultimately developed in the fibrinous envelope which has been formed around them.—The principal changes observed

in the blood of those affected by this disease, and which I have had an opportunity of remarking in two cases after death, are, an unusual thinness—a deficiency of fibrine and red particles—a state of partial anemia—and imperfect coagulation. This state has been also remarked by BÉCLARD, VELPEAU, ANDRAL, and KERR, whose observations respecting the presence of the cerebriform matter, surrounded by a fibrinous envelope, in the venous blood, fully confirm the view I have taken of its origin in this situation, and militate against its primary formation in this fluid. (See articles CANCER, § 26.; and DISEASE, § 141.)

21. vii. TREATMENT.—This is a subject on which much cannot be said with any hope of advantage. Surgical treatment is of no avail, and strictly medical means of very little more. Whatever excites pain, or irritates the local disease, tends to promote its growth; and whatever lowers constitutional power, only lays the system more open to contamination. The intentions, therefore, which we should propose to ourselves, when entering upon the treatment of this malady, are—1st, to support the powers of life, and thereby to resist as long as possible the extension of the disease;—2dly, to promote the secretions and excretions, as auxiliary to the first indication;—and, 3dly, to palliate the sufferings of the patient.

22. A. The first of these is founded upon the evident and admitted fact that the disease is dependent upon, and associated with, debility; and upon the results of observation; and the means which may be employed to fulfil it need not be materially different from those specified in the article CANCER (§ 29. et seq.). Although no medicine has hitherto proved successful in curing the malady, yet new remedies, or novel combinations of those that are old, should nevertheless be directed against it. Besides, judicious means have often prolonged life, or enabled the system to resist its progress for a time. Conformably with these views, the preparations of cinchona; the sulphate of quinine; the preparations and compounds of iron, particularly the ferrum ammoniatum, and the muriated tincture; sarsaparilla; bitter tonic infusions or decoctions, with liquor potassæ, or the alkaline subcarbonates; and the preparations of iodine,—may be severally used, and combined with some one of the more energetic narcotics, particularly the acetate or muriate of morphine, or conium, or belladonna, or aconitum.—The preparations of iodine are the most successful of any means I have employed, in resisting the progress of this morbid formation. The ioduret or iodide of iron, and the hydriodate of potash, should be selected, and taken internally in small or moderate doses. The external use of iodine is often injurious. In a case of this disease, affecting chiefly the stomach and some others of the abdominal viscera, lately under my care, a combination of the acetate of morphine and kresote palliated the urgent symptoms after other means had failed. In the still more recent case of a lady from Wales, who came to town on account of malignant disease of the stomach, that probably partook of the fungoid character, from the size of the tumour and other symptoms, this combination proved serviceable. This lady had been treated with great discrimination by Mr. SERRH of Welshpool. During her stay in London, the acetate of morphine in a dilute aro-

may succeed one another more or less rapidly ; but they are seldom attended by fever, unless they are large or numerous. When they form in the perinæum, or near the anus, difficulty of voiding urine is often felt. In other situations, they may affect the lymphatics proceeding from their seats, and the adjoining glands.

6. ii. *Causes*.—The application of blisters, frictions with irritating liniments or ointments, inattention to personal cleanliness, the use of sulphureous or alkaline baths, and various antecedent or associated affections, are the usual causes of this eruption. Furuncle is often consequent upon the decline of, or convalescence from, fevers, the exanthemata, and inflammatory disease of the skin ; and it often seems to depend upon weakness, or chronic inflammatory irritation, of the digestive organs ; or upon accumulation of sordes in the *prima via*. In some cases, however, it occurs without appreciable antecedent disorder.

7. iii. *Treatment*.—But little is required for this complaint beyond attention to the digestive organs. Accumulations of mucous sordes and fecal matters ought to be freely evacuated by an aperient consisting of equal parts of the compound infusions of gentian and senna with a neutral salt or alkaline subcarbonate. A bread and water poultice, or any other soothing and relaxing application, may be kept on the part. If the boil be large, and the pain considerable, the division of the skin, at the most prominent part, will be of service. When a succession of boils appears, an emetic may be given, and its operation promoted by the infusion of chamomile flowers. The above stomachic aperient may be afterwards continued daily, or on alternate days. If the eruption still appears from time to time, gentle tonics may be prescribed. Dr. FOSBROOK recommends large doses of sulphuric acid. Mr. COPLAND HUTCHISON informed me, that he found the liquor potassæ, or Brandish's alkaline solution, in any bitter tonic infusion, most beneficial in these cases. The extract of taraxacum may be added to a mixture or draught of this kind, and an alterative pill given at bedtime, and continued for some days.

8. II. HORDEOLUM—*Stye* ; *Phyma Hordeolum*, Good ; *Sclerophthalmia*, *σκληροφθαλμία* ; *Orgeolet*, Fr. ; *Gerstenhorn*, Germ.—is a small inflammatory tumour or boil in the free edge of the eyelids, most frequently near the inner angle of the eye.—It is in every respect a similar affection to furuncle, the difference arising entirely from the nature of its seat. It is seldom larger than a grain of barley, and is generally smaller, as its name indicates.—Its causes, progress, and treatment are in all respects the same as those of common boil.—This, and the preceding variety of furuncle, are most common in young persons, just before or soon after puberty, and in adults who eat largely and take much spirituous liquors.—In scrofulous constitutions, and persons addicted to intemperance, they assume a chronic form. In such cases, local applications with camphor are of service.

9. III. ASTHENIC FURUNCLE—*Atonic Furuncle* ; *Furuncle Atonique*, GUERSANT—consists of a small circumscribed swelling of the skin, in one or several situations, with or without livid discolouration ; followed by a very small purulent phlyctena, at the summit, and by softening, destruction, and large perforation of the corion under-

neath ; and preceded and attended by much debility and low fever.

10. This affection was described by M. GUERSANT, in 1823 ; and early in the same year I saw two cases of it, with Mr. PAINTKA, in a low street and ill-ventilated apartment in Westminster. Both occurred in unhealthy children in the same family, and terminated fatally. The bodies were inspected after death. Since then I have seen only three other cases, but I have met with others somewhat similar, consequent on the application of leeches.—All the instances which have occurred in my practice, as well as those seen by M. GUERSANT, were in children much weakened by previous disease ; or in those affected by gastro-intestinal irritation, or by chronic disorder of the bronchi, or asthenic inflammation of the substance of the lungs. There have always been, both before and after the appearance of this eruption, well-marked symptoms of adynamia ; and coma has generally come on before death.

11. i. *Description*.—This eruption appears chiefly on the trunk, the lateral parts of the neck, and insides of the thighs. In the cases which I have seen, the number of furuncles was considerable—not fewer than five or six ; and, in two cases, there were about twenty. They commence in small, circumscribed, and hard swellings, of a livid tint, but sometimes nearly colourless. At a further advanced stage, very small purulent phlyctenæ appear in their summits, that break, and leave the skin underneath of a greyish colour, softened, and perforated as in common furunculi. They discharge at first a serous, sanguineous, or ichorous fluid. The tumours soften and disappear ; and the perforations of the corion enlarge rapidly, producing, in two or three days, holes in the integuments, varying from three or four, to six or seven, or even eight or nine, lines in diameter. These perforations are perfectly round ; their margins are not elevated, nor thickened, nor injected ; and they entirely resemble the holes made by a drill or auger. The cellular tissue is not thrown off in the form of a core, but is destroyed by a rapid ulceration, or phagedenic absorption. The bottoms of the ulcers have a greyish or sanious appearance, and are nearly dry. There is no discharge from them, nor have they any tendency to scab ; and the perforations of the integuments frequently proceed down to the muscles, or aponeuroses, the peculiar structure of which may often be seen at their bottoms. The skin forming their margins is pale and somewhat softened, and the cellular tissue immediately beneath the cutaneous margins is often destroyed to the extent of one or two lines.—In the variety of asthenic furuncle following the bites of leeches in cachectic and debilitated children, which is the most common, the perforations of the skin are at first triangular, but their progress is nearly the same as that of the spontaneous variety, and as they enlarge they become entirely circular. The ulceration attending upon the advanced stage of disease is seldom very painful. Having reached the extent just described, it remains stationary for a longer or shorter time, and in the more unfavourable cases shows no disposition to reparation. When it evinces a disposition to heal, the bottom is more moist, somewhat redder, and more vivid ; the perforated margins of the skin become more closely connected with the subjacent tissues,

affections of the larynx or trachea, are experienced. If it take place in the parietes of the chest, the most severe pleuritic and pulmonary symptoms sometimes supervene, from the extension of the inflammation internally to the pleura, and thence even to the lungs. When it attacks the abdominal parietes, peritonitis has even occurred in a similar manner. Anthrax may also be associated with some other external eruption, especially with the common furuncle, which may either precede or accompany it.

18. ii. *Causes.*—Anthrax is most common in spring and summer, according to M. RAYER. It is certainly most frequent in persons past the meridian of life, and in females about the total cessation of the menses. High, rich, or gross living, with insufficient exercise, and a full, gross habit of body, predispose to it, and even more directly produce it. — Causes which derange the digestive and biliary functions, the application of acrid or stimulating matters to the skin, neglect of personal cleanliness, and the bites of insects, most commonly excite it. It is often a sequela of small-pox, measles, and typhoid fevers; and it is a common attendant upon plague, and sometimes even appears in the latter stages of the putro-adyynamic form of typhoid fever.

19. iii. *Diagnosis.*—Carbuncle is to be distinguished from the common boil, by the latter having only a single opening, and being smaller and more conical; and by several occurring in succession. The former, on the contrary, is broader, less acuminate, is perforated by several openings, is darker, and more gangrenous, and is generally single when occurring as an idiopathic disorder. According to DUPUYTREN and RAYER, however, anthrax is a tumour formed by the conglomeration and confluence of several furuncles. Carbuncle has very generally been confounded with malignant pustule, or anthracion. The latter belongs to a different order of affections of the skin; and is described, as well as distinguished from anthrax, in the article PUSTULES.

20. iv. *Treatment.*—This should be commenced with the exhibition of an emetic, the operation of which may be promoted by a tepid infusion of chamomile flowers. A full dose of calomel and James's powder should afterwards be given, and the free action of the bowels promoted by purgatives. Whenever the pulse is strong, full, or hard, bloodletting, according to the age and habit of the patient, is requisite, particularly early in the disease. Leeches ought also to be applied around the base of the tumour, and the bleeding from their bites encouraged by tepid fomentations. A repetition of the local depletions may be required even oftener than once. Diaphoretics, with tartarised antimony and opium, if the pain and burning be very severe, should afterwards be given, and the bowels kept open by the occasional exhibition of a purgative. When the attendant fever is of a low form, or when gangrene has taken place, and suppuration continued for some time, especially when the patient is aged, of a cachectic habit, or is addicted to intoxication, or is greatly debilitated, the decoction of cinchona, with the alkaline subcarbonates; the

sulphate of quinine with camphor; tonic infusions with muriatic acid, and chloric ether; and the means advised in putro-adyynamic fever, should be prescribed, with light nourishment, wine, &c.

21. The local treatment should consist chiefly of refrigerant applications in an early stage of the swelling. Compresses moistened with equal parts of pyroligneous acid and rose-water, to which some camphor has been added, should be constantly applied from the commencement. They generally relieve the pain and burning heat. If the inflammation still proceeds, a *crucial incision*, completely across the swelling, and down to its base, as advised by DUPUYTREN and RAYER, should be made. This will give instant relief by the loss of blood, and by removing the strangu-lation of the vessels and cellular tissue. It also averts gangrene, facilitates a healthy suppurative action, and hastens granulation and recovery. The actual and potential cauteries formerly advised, are now rarely employed. Several American writers recommend the application of blisters over the swelling—the discharge from the surface favouring a return of healthy action in the diseased part.

22. When anthrax is complicated with any of the internal affections indicated above (§ 17.), the treatment ought to be decided and appropriate to the morbid associations, as the progress of the complication is generally rapid, owing to the unfavourable state of constitution giving rise to this kind of local disease.—During convalescence, sulphureous baths, and the aperient sulphureous mineral waters, with strict attention to the functions of the digestive organs, and to diet and regimen, are usually productive of benefit. I have found the following medicines of service, when the patient cannot resort to suitable mineral waters.

No. 228. R. Infus. Sennæ Comp., Infus. Gentianæ. Co. ʒʒ 3vj.; Sodæ Sub-carbon. gr. xij.; Spirit. Ammon. Arom. ʒss.; Tinct. Cardamom. Co. ʒj. M. Fiat Haustus, alternis noctibus sumendus.

No. 229. Potassæ Supertart. in Pulv. ʒj.; Sulphuris Precipitat. ʒij.; Confect. Sennæ ʒij.; Syrup. Zingiberis q. s. ut fiat Electuarium molle, cujus capiat Coch. j. minimum, horâ somni quotidie.

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ii. ASSEPTIC FURUNCLE.—Guérard, in Archives Générales de Médecine, t. i. p. 336.—I find, upon reference to the London Medical Repository, for July, 1823, p. 32, that I described this eruption in the London Medical Society, at the commencement of that year; and that soon afterwards M. GUERARD's paper respecting it appeared in the Archives. It was thus noticed, for the first time, almost simultaneously by this physician and myself.

iii. CARBUNCLE.—Crisus, l. v. sect. 28.—A. Tasi, De Anthracæ seu Carbunculo Tractatus, 4to. Venet. 1576.—C. P. De Herrera, De Carbunculis Animadversa 4to. Pintie, 1604.—T. D. Mitchell, New York Med. and Phys. Journ. 1815, vol. ii. p. 64.—J. R. Beck, in Ibid. 1823, vol. ii. p. 37.—D. Hosack, Essays on Various Subjects. N. Y. 1824, vol. ii. p. 236.—A. Cooper, Lectures, Lancet, vol. i. p. 245.—Sanson, in Dict. de Méd. et Surg. Prat. t. iii. p. 26.—Marjolin, Dict. de Méd. 2d edit. Paris, 1833, art. Anthrax.—Dupuytren, Leçons, Lancette Française, Mars, 1833.—Rayer, Opus cit. p. 542.—R. Coates, in Amer. Cyclop. of Pract. Med. vol. ii. p. 22.—J. Green, Opus cit. p. 270.

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